

# Development and Validation of the Leadership Behaviour Assessment (LBA)

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## Abstract

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**Purpose** – The aim of the study was to develop a new measure of leadership, the Leadership Behaviour Assessment (LBA), and to assess criterion-related validity (CRV) of the new measure. The LBA was developed in accordance with existing leadership theory, and incorporates ten key behaviour types. CRV was assessed through associations between managers' LBA scores and subordinate ratings on established scales and overall leadership scores.

**Design/Methodology/Approach** – A concurrent criterion-related validation study with 39 managerial employees was conducted. Correlation analysis between LBA scores and subordinate ratings of manager's behaviours and overall leadership scores were used to evaluate CRV.

**Findings** – Evidence for CRV was suggested through correlations between three covert LBA metrics and multiple criterion scores. The three LBA metrics accounted for significant variance in leadership effectiveness.

**Implications/Limitations** – The LBA is a new measure for use in selection, or training and development, for leadership positions, which includes objective measurement. However, key limitations include the reliance on subordinate ratings, limited sample size, and the low stakes testing context.

**Originality/Value** – The LBA offers an alternative to the commonly used self-report measures of leadership effectiveness, thus reducing associated biases. The program incorporates more realistic options and workplace decisions, and includes covert measures, free from respondent bias.

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## Chapter One: Introduction

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### Leadership Theory and Measurement

The varied and drastic impact of leadership actions and decisions on organisations and individual employees has been widely documented. Specifically, leadership impacts upon performance from the individual to the organisational level, as well as employee attitudes and behaviours, such as innovation, motivation, and turnover (Avolio, Reichard, Hannah, Walumbwa, & Chan, 2009; Hiller, DeChurch, Murase, & Doty, 2011; Schyns & Schilling, 2013; Skogstad, Einarsen, Torsheim, Aasland, & Hetland, 2007). Poor leadership can, therefore, be extremely costly for organisations, in terms of both monetary and affective detriments. Given the importance of leadership in the success of a company and the wellbeing of their employees, the following sections define and review theories, key components, and measurement of leadership effectiveness.

Several key theories of effective leadership styles are reviewed in Chapter One, identifying behaviours posited in multiple theories, and providing evidence for the direct relationship between each of these behaviours and criteria of effective leadership. A review of leadership measurement methods then reveals issues and limitations of existing measures. In order to overcome these limitations, and offer a more authentic measure of behaviour, the focus of this dissertation was to create a new measure called the Leadership Behaviour Assessment (LBA). The process for development of the LBA is outlined, followed by a validation study in Chapter Two, which primarily assessed the criterion-related validity of the LBA, while also examining other aspects of its measurement ability. Results of the validation study are presented in Chapter Three. A discussion of the findings and their implications, follows in Chapter Four, along with applications of the LBA, while attending to study limitations, and outlining further research requirements.

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The key purpose of the following review was to provide sound theoretical underpinnings for the new measure, and identify existing measurement issues to develop the assessment in such a way as to reduce the possibility of such issues. Specifically, three key areas of difference were made possible for the new measure, further detailed in the following sections. Firstly, the inclusion of a variety of leadership theories allows sound theoretical foundation of the LBA, and interpretation and use of the LBA across multiple contexts, in accordance with situational leadership theory. Second, the design of the LBA allows for a more authentic display of behaviours, and includes covert measures, reducing the possibility of 'playing the system'. Third, the LBA provides an alternative to commonly used questionnaires, in particular self-report, which greatly reduces opportunity for biases associated with such assessment methods. The overall purpose of creating the LBA was to provide an evidence-based measure of effective leadership, designed to overcome existing measurement issues, predominantly for use in selection procedures, though also applicable to training and development or succession planning.

### 1.1 Leadership Theory

Alimo-Metcalfe (2013) outlined several key stages in the evolution of leadership theory, though many theories expanded or built upon previous notions, thus many underlying ideas are not exclusive to one stage. Leadership theory originated in what are referred to as 'trait' theories of leadership, which aimed to identify personality characteristics that set apart effective leaders. These theories were founded on the notion that effective leadership was not learned, but rather some individuals were simply born with the characteristics necessary for good leadership (Alimo-Metcalfe, 2013). Later came the shift to 'behavioural' theories, which instead aimed to identify behaviours of effective leaders, wherein observations of many leaders were conducted to ascertain behavioural patterns. Such research resulted in several different styles of leadership theorised, however, as various behavioural profiles were



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observed in leaders who achieved some degree of success (Alimo-Metcalfe, 2013). As with trait theories, these behavioural theories failed to account for contextual factors which may influence the effectiveness of particular behaviours. Thus, the emergence of situational theories followed. Situational leadership theories posited different situations require different leader behaviours (Alimo-Metcalfe, 2013). Therefore, though considered a criticism by many, the large number of styles identified in behavioural theories may actually be due to different behaviours required for effectiveness under differing situations or with different groups of followers. Further, researchers began considering the interaction between leaders and followers, rather than the leader in isolation as a top-down influence. Building on the consideration of the followers, and with the addition of higher purpose, ‘charismatic-inspirational’ or ‘neo-charismatic’ theories were developed, which posit the leader as a visionary, who aims to benefit all those within, or impacted by, the organisation. Finally, several theories outlined leaders who act ethically, honestly, and place others above their own benefit (Alimo-Metcalfe, 2013). These theories were created largely due to a need for morals in leadership, highlighted by prominent cases of leaders taking advantage of the power of their position.

Several leadership theories were reviewed, as outlined in the following sections, to identify commonly mentioned behaviours which are associated with effective leadership, in accordance with the theory groupings outlined by Dinh and colleagues (2014). Leadership styles comprising behaviours associated with effective leadership included Full-Range Leadership theory’s transformational and transactional leadership, charismatic leadership, strategic leadership, team leadership, empowering leadership, and ethical/moral leadership theories, including servant leadership, ethical leadership, and authentic leadership. The purpose of the review identifying key behaviours was to guide creation of the new measure, the Leadership Behaviour Assessment (LBA). As the LBA is designed to assess behaviours,

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traits, or context-specific theories/styles are excluded, such as those included in the ‘trait’ or ‘situational’ theories of leadership. Consideration was given to incorporation of situational/contextual leadership theories, which posit different styles of leadership may be beneficial in different contexts. Specifically, multiple leadership theories were reviewed to identify behaviours associated with various leadership styles for inclusion in the LBA, as opposed to many existing measures which are founded on a single leadership theory (e.g. Bass, 1985; Costa & McCrae, 1992; Judge, Bono, Ilies, & Gerhardt, 2002). Including these various identified behaviours in the LBA may allow for interpretation under different contexts, based on the leadership style considered most suited by those selecting/training for the role. A brief overview for each of the leadership theories/styles reviewed is provided in the following sections.

### *1.1.1 Transformational Leadership*

Transformational leadership comprises of four dimensions; idealised influence, inspirational motivation, intellectual stimulation, and individualised consideration (Bass & Riggio, 2006). Idealised influence refers to the admirable personality of, and capability modelled by, the leader. Inspirational motivation entails the leader’s vision for a better future, and their ability to motivate and inspire followers, inciting positivity and enthusiasm to achieve this vision. Intellectual stimulation is shown in leaders challenging current processes/systems, cultivating creativity and promoting new ways to approach problems. Finally, individualised consideration refers to personal interaction to support and develop individual followers, accepting their differences and providing for their individual needs. Thus, the transformational leader acts as a model for positive organisational behaviours, while inspiring and motivating towards common goals, cultivating creative problem-solving, and attending to and developing individual followers (Bass & Riggio, 2006).

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### *1.1.2 Transactional Leadership*

Transactional leadership encapsulates reinforcement, through the use of rewards, for specific behaviours or performance criteria (Bass & Riggio, 2006). These reward types formulate the three dimensions; contingent reward, management by exception – active, and management by exception – passive. Contingent reward uses positive reinforcement in exchange for agreed goals or behaviours, resulting in development and improved performance of followers (Bass & Riggio, 2006; Judge & Piccolo, 2004). Both active and passive management by exception, however, use negative reinforcement following underperformance or mistakes, though these are less effective techniques (Bass & Riggio, 2006) and thus, not included as behaviours associated with effective leadership.

### *1.1.3 Charismatic Leadership*

Though there may be overlap between charismatic leadership and transformational leadership, specifically regarding idealised influence and inspirational motivation, several researchers argue charismatic leadership remains distinct from transformational leadership (Bass & Riggio, 2006; Conger, Kanungo, & Menon, 2000; Shamir, House, & Arthur, 1993). Charismatic leadership entails three aspects, centred around identification and implementation of change. First, the leader challenges current systems in order to detect possible areas for improvement. The leader then creates a vision of such improvements, and encourages espousal of their vision. Finally, the leader initiates changes to achieve their vision, which are often self-sacrificial, risky, and/or unconventional (Conger et al., 2000).

### *1.1.4 Strategic Leadership*

Strategic leadership posits organisational outcomes are directly determined by leadership decisions, and the organisation is framed by aspects of top level leaders, such as their expertise and values (Cannella & Monroe, 1997). Further, Boal and Hooijberg (2000) propose strategic leadership encompasses three key aspects; absorptive capacity, adaptive

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capacity, and managerial wisdom. Absorptive capacity involves continuous acquisition and implementation of relevant new knowledge. Adaptive capacity is an ability to change and adjust to changes in circumstances. Managerial wisdom includes sensitivity to contextual and social factors, to identify possible environmental changes, and possess and understanding of others and their interactions (Boal & Hooijberg, 2000).

### *1.1.5 Team Leadership*

Team leadership specifically encompasses management of effective teams, and posits that team leaders identify and resolve team needs through effective strategy formulation and implementation (Zaccaro, Rittman, & Marks, 2001). Zaccaro and colleagues (2001) posit team leaders utilise four key functions for effective strategies. The leader is first required to attain relevant new knowledge to guide strategy formation (information search and structuring), and secondly the leader must incorporate such knowledge to select appropriate actions to resolve issues or instigate necessary changes (information use in problem solving). Throughout, the leader is also responsible for motivating, overseeing, and developing subordinates (managing personnel resources), as well as ensuring effective resource acquisition and allocation (managing material resources), such that subordinates have necessary resources to achieve goals (Zaccaro et al., 2001).

### *1.1.6 Moral/Ethical Leadership Theories*

Several theories incorporate a moral basis of leadership, including servant leadership, ethical leadership, and authentic leadership. Servant leadership posits that the leader wishes to lead purely for the purpose of tending to other's needs (van Dierendonck, 2011). Sendjaya, Sarros, and Santora (2008) outline six aspects of the servant leader; voluntary subordination, authentic self, covenantal relationship, responsible morality, transcendental spirituality, and transforming influence. Voluntary subordination encapsulates the leader voluntarily putting other's needs above their own and tending to these needs. The authentic self emerges through

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the wish to lead to serve others, as their leadership is considered a reflection of their ‘true self’. Covenantal relationships are close bonds which result, in this context, through the leader’s acceptance and equal treatment of all followers. Responsible morality refers to the use of moral and ethical frameworks to guide development of processes, goals, and strategies. The spiritual values espoused by the leader to tend to followers is referred to as transcendental spirituality. Finally, transforming influence posits that servant leaders imbue their spiritual values in followers, spreading servant leadership (Sendjaya et al., 2008).

Authentic leadership and servant leadership overlap in several key aspects, as both espouse moral foundations, development of followers, and a strong understanding of the self (Sendjaya et al., 2008). The two theories differ, however, in that the authentic leader is not necessarily founded in strong spiritual values (Sendjaya et al., 2008). Authentic leadership was initially defined as leaders who hold themselves accountable, display fairness and transparency in interactions, and remain their ‘true self’, rather than taking on a work persona (Gardner, Coglisier, Davis, & Dickens, 2011). Further development of authentic leadership outlined the requirement of the leader to display strong self-awareness, and included passion, positivity, vision, and development of others (Gardner et al., 2011).

Authentic leadership and ethical leadership also overlap, though Brown and Treviño (2006) suggest they differ in that ethical is more other-focused and involves active attempts to influence followers’ behaviour through articulating, modelling, and reinforcing ethical conduct. Ethical leadership refers to the decisions and actions of the leader in accordance with societal norms for what is appropriate and virtuous, and advocating for the same among subordinates (Brown & Treviño, 2006).

### *1.1.7 Empowering Leadership*

Empowering leadership posits that allowing followers greater autonomy and shared responsibility with the leader will result in increased intrinsic motivation in followers,

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increasing their performance (Hassan, Mahsud, Yukl, & Prussia, 2013; Srivastava, Bartol, & Locke, 2006). Moreover, the theory outlines five key components required for a leader to achieve this, as follows. Firstly, the leader acts as a role model for desirable behaviours and competencies. The leader also acts as a mentor, directly guiding and developing their immediate followers. Third, the leader must display care and concern for individual followers and their needs. Furthermore, followers must be included in the decision-making processes. Finally, the leader must provide followers with the knowledge necessary to achieve the tasks and goals set out for their role (Srivastava et al., 2006).

### 1.2 Leadership Behaviours

The nine prominent leadership theories, outlined above, were reviewed to identify behaviour types related to effective leadership, as shown in Table 1, in order to guide the creation of a measure, the Leadership Behaviour Assessment (LBA), incorporating each behaviour type. The following sections review each behaviour type, within a leadership framework, and outline some associated outcomes at both the individual and organisational level, as presented in Table 2. A key purpose of the LBA is to provide relevant information for use in selection processes for leadership positions. Hence, although several leadership theories posit the reciprocal effect of the subordinates on the leader, as well as the context of the role, in the framework of candidate selection, these factors are difficult to account for in a measurement tool. To allow for generalisability, the LBA could not be created to simulate leader-subordinate interactions, a particular role, or organisational context. Such factors limit most selection measurement tools, including the commonly used self-report questionnaires. Those who are conducting specific recruitment should, however, consider contextual factors and interpret any selection measures within the specific setting of the role. Consideration has been made for context-specific (or role-specific) versions of the LBA, though this is outside the scope of the present study, and merely a contemplation for future development.

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**Table 1.**

*Behaviours Featured in Key Leadership Theories*

Behaviour	Leadership Style								
	Transformational	Transactional	Charismatic	Strategic	Team	Servant	Authentic	Ethical	Empowering
Communicates									
<i>Collaborates</i>	✓			✓	✓		✓		✓
<i>Shares Knowledge</i>	✓			✓	✓	✓	✓		
Decisive				✓				✓	
Delegates	✓				✓				✓
Develops trust	✓		✓			✓	✓	✓	
Inclusive					✓	✓	✓		
Just – Promotes Justice	✓					✓		✓	
Promotes Mentoring	✓				✓				
Provides Feedback	✓	✓			✓				
Supports Innovation	✓		✓	✓		✓			
Encourages Change/ Development	<i>Excluded: Relies on specific context (change)</i>								
Solves Problems	<i>Excluded: Relies on specific context (problems).</i>								
Manages Resources and Personnel	<i>Excluded: Relies on specific context (personnel/resources).</i>								
Inspires Vision	<i>Excluded: Inspirational vision is too complex and requires follower response for measurement.</i>								

*Note.* ✓ indicates behaviour is mentioned in theory. Information is collated from section 1.1 above, see relevant paragraphs for sources.

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### *1.2.1 Communication*

The importance of communication in organisations has been widely documented, hence its inclusion in six of the reviewed theories, including transformational leadership (Bass & Riggio, 2006), strategic leadership (Boal & Hooijberg, 2001), team leadership (Zaccaro et al., 2001), servant leadership (Sendjaya et al., 2008), authentic leadership (Luthans & Avolio, 2003), and empowering leadership (van Dierendonck & Dijkstra, 2012). Several leadership theories suggest a two-way share of information is necessary for effective leadership (Bass & Riggio, 2006; Boal & Hooijberg, 2001; Brown & Treviño, 2006; Sendjaya et al., 2008). Thus, communication activities within the LBA were separated into the act of acquiring knowledge or collaborating with others, and the act of sharing knowledge openly.

As outlined in these theories, collaborates/acquires knowledge entails leaders seeking and actively listening to information, solutions, and ideas from those within the organisation, as well as external stakeholders (Bass & Riggio, 2006; Boal & Hooijberg, 2001; Luthans & Avolio, 2003; Srivastava et al., 2006; Zaccaro et al., 2001). Sharing knowledge refers to leader transparency and clarity, and freely available information throughout the organisation (Bass & Riggio, 2006; Brown & Treviño, 2006; Luthans & Avolio, 2003; Sendjaya et al., 2008; Zaccaro et al., 2001). A wide array of positive outcomes have been associated with the two aspects of communication in conjunction, as shown in Table 2, including increased job performance ( $r=.26, p<.01$ ) organisational commitment ( $r=.60, p<.01$ ; Chen, Silverthorne, & Hung, 2006:  $r=.67, p<.001$ ), job satisfaction ( $r=.74, p<.001$ ; Men & Stacks, 2014), engagement ( $r=.67, p<.01$ ), work-life enrichment ( $r=.77, p<.01$ ; Jiang & Men, 2017), organisational identification ( $r=.49, p<.001$ ; Smidts et al., 2001), as well as reduced job stress factors including role conflict ( $r=-.31, p<.05$ ), ambiguity ( $r=-.40, p<.05$ ), and overload ( $r=-.27, p<.05$ ), burnout ( $r=.25, p<.05$ ), and turnover ( $r=-.37, p<.05$ ; Kim & Lee, 2009).



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### *1.2.2 Decisiveness*

Inspection of Table 1 shows two theories outline the need for relevant decision making, which entails decisiveness: First, strategic leadership, due to the requirement of strategic decision making (Boal & Hooijberg, 2001), as well as ethical leadership, as it requires moral decision making (Brown & Treviño, 2006). Decisiveness entails quick decision speeds, which are posited to indicate a lack of doubt by the leader (van de Calseyde, Evans, & Demerouti, In press). Leader decisiveness is associated with positive organisational outcomes including improved performance factors of growth ( $r=.19, p<.01$ ) and profit ( $r=.12, p<.05$ ; Baum & Wally, 2003), as well as employee cooperation with leader ( $r=.77, p<.01$ ; van de Calseyde et al., In press), as shown in Table 2. Decision speed is able to be objectively measured, through the time between information presentation and a selected response, which presented an opportunity to include objective measurement within the LBA.

### *1.2.3 Delegation*

Delegation is an effective tactic for leaders, not only to reduce their workload allowing greater time for other necessary tasks, but also in portraying that the leader feels subordinates are capable, thus improving their own feelings of efficacy, and improving their breadth of expertise (Bass & Riggio, 2006; van Dierendonck & Dijkstra, 2012; Zaccaro et al., 2001). Furthermore, in accordance with team leadership, delegation allows utilisation of individuals with the most relevant and advanced skills or knowledge (Zaccaro et al., 2001). Delegation is also outlined in the development of followers in transformational leadership (Bass & Riggio, 2006) and empowering leadership (van Dierendonck & Dijkstra, 2012). Table 1 presents the mention of delegation in these three leadership theories. As shown in Table 2, delegation has been associated with increased innovative behaviour ( $r=.24, p<.01$ ; Chen & Aryee, 2007), commitment ( $r=.37, p<.01$ ; Chen & Aryee, 2007), job performance ( $r=.26, p<.01$ ; Chen & Aryee, 2007;  $r=.38, p<.01$ ; Schriesheim, Neider, & Scandura, 1998),

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satisfaction ( $r=.42, p<.01$ ; Chen & Aryee, 2007;  $r=.40, p<.01$ ; Schriesheim et al., 1998), and improved relationship with leader ( $r=.39, p<.01$ ; Schriesheim et al., 1998).

### *1.2.4 Developing Trust*

Various actions of the leader may promote a relationship with followers to cultivate trust in the leader and the leader's actions, such as recurring, consistent rewards (Judge & Piccolo, 2004), attending to individual's needs (Bass & Riggio, 2006; Conger et al., 2000), as well as accepting others and treating them fairly and equally (Sendjaya et al., 2008). As shown in Table 1, trust is referred to in six of the theories, including transformational leadership (Bass & Riggio, 2006; Judge & Piccolo, 2004), transactional leadership (Judge & Piccolo, 2004), charismatic leadership (Conger et al., 2000), servant leadership (Sendjaya et al., 2008), ethical leadership (Brown & Treviño, 2006), and authentic leadership (Luthans & Avolio, 2003). Trust positively correlates with extra work effort ( $r=.63, p<.01$ ), satisfaction with leader ( $r=.76, p<.01$ ; Gillespie & Mann, 2004;  $r=.73, p<.01$ ; Dirks & Ferrin, 2002), relationship with leader ( $r=.69, p<.01$ ), job performance ( $r=.16, p<.01$ ), commitment ( $r=.49, p<.01$ ), reduced turnover intention ( $r=-.40, p<.01$ ), job satisfaction ( $r=.51, p<.01$ ; Dirks & Ferrin, 2002;  $r=.67, p<.01$ ; Braun, Peus, Weisweiler, & Frey, 2013;  $r=.43, p<.05$ ; Rich, 1997), and organisational performance ( $r=.30, p<.05$ ; Rich, 1997), as presented in Table 2.

### *1.2.5 Inclusiveness*

Inclusiveness refers to encouragement and acceptance of participation from all organisational members, and allows for diversity of individuals and ideas (Luthans & Avolio, 2003; Sendjaya et al., 2008; Zaccaro et al., 2001). Inclusiveness is outlined across five of the reviewed theories, as shown in Table 1, including transformational leadership (Bass & Riggio, 2006), charismatic leadership (Conger et al., 2000), team leadership (Zaccaro et al., 2001), servant leadership (Sendjaya et al., 2008), and authentic leadership (Luthans & Avolio, 2003). Inspection of Table 2 shows several positive outcomes are associated with

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leader inclusiveness, such as increased job satisfaction ( $r=.27, p<.001$ ; Brimhall, Lizano, & Mor Barak, 2014;  $r_s=.26$  and  $.41$ ; Mor Barak, Levin, Nissly, & Lane, 2006;  $r=.51, p<.05$ ; Nishii, 2013), well-being ( $r=.20, p<.01$ ; Travis & Mor Barak, 2010;  $r_s=.15$  and  $.27, p_s<.01$ ), and organisational commitment ( $r_s=.24$  and  $.42, p_s<.01$ ), as well as decreased stress ( $r_s=-.44$  and  $-.56, p_s<.01$ ; Mor Barak et al., 2006), relationship conflict ( $r=-.64, p<.05$ ), role conflict ( $r=-.58, p<.05$ ; Nishii, 2013;  $r=-.22, p<.01$ ) and role ambiguity ( $r=-.21, p<.01$ ; Travis & Mor Barak, 2010), as well as decreased turnover ( $r=-.23, p<.01$ ; Nishii, 2013;  $r_s=.11$  and  $.23, p_s<.05$ ; Mor Barak et al., 2006;  $r=-.21, p<.01$ ) and disengagement ( $r=-.22, p<.01$ ; Travis & Mor Barak, 2010).

### 1.2.6 *Just/Promotes Justice*

Justice refers to the leader's enactment and promotion of fairness within organisational processes, and includes interactional, procedural, and distributional justice, wherein fairness is perceived in treatment of individuals during decision-making, the procedures used to arrive at decisions, and the outcomes of decisions (Saunders & Thornhill, 2003). Thus, just behaviour entails the leader promoting fairness in treatment of followers and during decision-making processes, and ensuring decisions lead to fair outcomes, as outlined in both servant leadership (Sendjaya et al., 2008) and ethical leadership (Brown & Treviño, 2006), presented in Table 1. As shown in Table 2, justice positively correlates with organisational citizenship behaviours ( $r_s=.21$  and  $.26, p_s<.05$ ), organisational commitment ( $r=.42, p<.001$ ), relationship with leader ( $r=.52, p<.001$ ; Tansky, 1993), job performance ( $r_s$  between  $.15$  and  $.19, p_s<.001$ ), job satisfaction ( $r_s$  between  $.56$  and  $.71, p_s<.001$ ; Fernandes & Awamleh, 2006;  $r=.52, p<.01$ ; Nishii, 2013;  $r=.45, p<.001$ ; Tansky, 1993), engagement ( $r_s=.27$  and  $.37, p_s<.01$ ) and negatively correlates with turnover ( $r_s=-.31$  and  $-.37, p_s<.01$ ; Malinen, Wright, & Cammock, 2013;  $r=-.35, p<.01$ ), relationship conflict ( $r=-.51, p<.01$ ) and role conflict ( $r=.47, p<.01$ ; Nishii, 2013).

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### *1.2.7 Promotes Mentoring*

A leader may act as both a role model for mentoring, by mentoring their subordinates directly, and as an advocate for other managers and supervisors to provide mentoring to their subordinates and promote a supportive environment to facilitate openness (Gregory, Levy, & Jeffers, 2008). A mentoring relationship is outlined as a reciprocal, collaborative interaction, wherein goals are set, guidance to reach these goals is provided, and progress is monitored (Gregory et al., 2008). As indicated in Table 1, mentoring and/or promotion of mentoring is outlined in transformational leadership (Bass & Riggio, 2006; Judge & Piccolo, 2004) and team leadership (Zaccaro et al., 2001), and is associated with increased motivation ( $r=.28$ ,  $p<.05$ ), job performance ( $r=.21$ ,  $p<.05$ ; Chao, Walz, & Gardner, 1992), organisational commitment ( $r=.32$ ,  $p<.01$ ; Colarelli & Bishop, 1990;  $r=.57$ ,  $p<.001$ ; Lapointe & Vandenberghe, 2017;  $r=.24$ ,  $p<.05$ ), job satisfaction ( $r=.29$ ,  $p<.05$ ; Scandura & Williams, 2004), and reduced turnover ( $r=-.16$ ,  $p<.05$ ; Lapointe & Vandenberghe, 2017), as shown in Table 2.

### *1.2.8 Provides Feedback*

As with mentoring, leaders can both lead by example in providing feedback, as well as cultivate an environment of openness to facilitate seeking and provision of feedback. In accordance with Steelman, Levy and Snell (2004), providing feedback entails timely provision of effective positive and negative feedback, as well as promotion of feedback seeking activities. Table 1 shows feedback is posited in both transformational and transactional leadership (Bass & Riggio, 2006), as well as team leadership (Zaccaro et al., 2001), and Table 2 presents associations with role clarity ( $r=.56$ ,  $p<.01$ ), extra-role behaviours ( $r=.16$ ,  $p<.05$ ), job performance ( $r=.21$ ,  $p<.05$ ; Whitaker, Dahling, & Levy, 2007;  $r=.24$ ,  $p<.01$ ), motivation ( $r=.23$ ,  $p<.01$ ; Guo, Liao, Liao, & Zhang, 2014), job satisfaction ( $r=.44$ ,  $p<.001$ ; Harris, Wheeler, & Kacmar, 2009), engagement ( $r=.17$ ,  $p<.001$ ; Bezuijen,

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van Dam, van den Berg, & Thierry, 2010;  $r=.23$ ,  $p<.01$ ), and innovation ( $r=.18$ ,  $p<.05$ ; Eva, Meacham, Newman, Schwarz, & Tham, 2019), as well as decreased turnover ( $r=-.41$ ,  $p<.001$ ; Lonsdale, 2016) and burnout ( $r=-.30$ ,  $p<.001$ ; van den Broeck, Vansteenkiste, De Witte, & Lens, 2008).

### *1.2.9 Supports Innovation*

Leaders support innovation through fostering creativity and encouraging questioning of existing systems and consideration of alternative ways to think about, and solve, problems (Bass & Riggio, 2006; Conger et al., 2000). Table 1 identifies support for innovation as a factor within transformational leadership (Bass & Riggio, 2006; Judge & Piccolo, 2004), charismatic leadership (Conger et al., 2000), strategic leadership (Boal & Hooijberg, 2001), and servant leadership (Sendjaya et al., 2008). As shown in Table 2, support for innovation is associated with increased performance ( $r=.18$ ,  $p<.01$ ), job satisfaction ( $r=.41$ ,  $p<.01$ ; Nemanich & Keller, 2007), innovation ( $r=.37$ ,  $p<.001$ ; Jung, Chow, & Wu, 2003), commitment ( $\beta=0.52$ ,  $p<.001$ ; Henkin & Holliman, 2009), and decreased turnover ( $r=-.69$ ,  $p<.01$ ; Dee, 2004).

### *1.2.10 Summary*

Ten key behaviour types were identified across nine prominent leadership theories. Theory posits each behaviour type is associated with effective leadership, and research provides evidence that each correlates with benefits for both individuals and organisations, as shown in Table 2. The behaviour types were collated to provide a foundation, with a strong theoretical basis, for the LBA. Specifically, activities within the LBA were designed to allow opportunities to present each behaviour type. Further detail on the design process is outlined in Section 2. The LBA was designed to function differently to existing leadership measures, to reduce limitations associated with these tools. As such, the following section outlines several commonly used leadership measures and the limitations associated with such tools.

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**Table 2.**

*Individual and Organisational Outcomes of Behaviours Featured in Key Leadership Theories*

Behaviour	Outcomes																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Communicates <sup>a</sup>	+	+	+	+	+	+	+	–	–									
Decisive										+	+							
Delegates	+	+	+									+	+					
Develops trust	+	+	+				+			+			+	+	+			
Inclusive	+		+	+			+	–								+	–	
Just – Promotes Justice	+	+	+	+			+	–					+		+		–	
Promotes Mentoring	+	+	+				+											+
Provides Feedback		+	+	+			+	–	–			+			+			+
Supports Innovation	+	+	+				+					+						

*Note.* <sup>a</sup>Collaborates and Shares Knowledge/open. 1. Organisational Commitment. 2. Job Performance. 3. Job Satisfaction. 4. Engagement. 5. Work-Life Enrichment. 6. Organisational Identification. 7. Retention. 8. Job Stress Factors. 9. Burnout. 10. Organisational Performance. 11. Cooperation with Leader. 12. Innovation/Innovative Behaviour. 13. Relationship with Leader. 14. Satisfaction with Leader. 15. Extra Role Effort/Behaviour. 16. Employee Well-Being. 17. Relationship Conflict. 18. Motivation. + indicates increased/improved outcome. – indicates reduced outcome. Information is collated from section 1.2 above, see relevant paragraphs for sources.

### 1.3 Leadership Assessment

Given the vast impact of leadership, it is important to ensure well-informed decisions are possible when selecting for leadership positions. Selection decisions often rely on assessment tools to provide a measure of the individual's leadership effectiveness. Leadership assessment comes in many forms and is a vital part of selection, succession planning, and training and development. Generally, such tools aim to measure a set of criteria assumed to predict performance, based on leadership theory, including tests of specific abilities, traits, or behaviours of the individual, expected to result in effective leadership. In the following sections, different assessment types are outlined, highlighting differences in utility for selection. An overview of questionnaires follows, as these are a commonly implemented tool to administer these assessments, particularly self-report questionnaires, though several limitations are reviewed. Examples of commonly used measurement tools are outlined, though a review of all current measurement methods and tools is beyond the scope of the present paper.

#### *1.1.1 Assessment Types*

Three key types of assessments are commonly used in measuring leadership, including personality inventories (DeRue, Nahrgang, Wellman, & Humphrey, 2011), ability tests (Taggar, Hackett, & Saha, 1999), and behavioural tests/exercises (Whetzel, Rotenberry, & McDaniel, 2014), as outlined above. Personality inventories, which are founded in 'trait' theories of leadership, measure a set of personality characteristics expected to predict effective leadership (DeRue et al., 2011). Personality inventories are the most commonly used measurement type for leadership assessment in selection and training within organisations. Though common, predictive validity for personality is limited (DeRue et al., 2011), as outlined below, indicating it is a minor aspect relating to performance. Moreover, personality is an unalterable factor, and therefore measurement for training and development

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settings is ineffective. Rather, measuring malleable factors, such as ability or behaviours, is more suitable. Ability tests, which measure specific skills considered to be required for effective leadership, are also frequently used in selection (Taggar, Hackett, & Saha, 1999; Kaufman, 1983), though less so for leadership positions. As with personality, however, ability also demonstrates low predictive validity (DeRue et al., 2011), again indicating it is a minor factor for consideration. Behavioural tests, founded in 'behavioural' theories of leadership, measure a set of behaviours expected to predict effective leadership (Whetzel, Rotenberry, & McDaniel, 2014). Behavioural tests are the least utilised measurement type for selection and training, with few measures currently available. Despite their low implementation, behavioural tests appear to show higher predictive validity than personality or ability tests (DeRue et al., 2011). Thus, there exists a gap in current measurement methods, wherein behaviours associated with effective leadership are largely unaccounted for in the selection process for leadership positions.

### *Ability Measures*

Several different abilities may be considered necessary for effective leadership, depending on the specific context of the role. One of the most popular abilities to measure is general mental ability (GMA), or intelligence. GMA tests have been widely used on the basis that intelligence predicts effective leadership. Examples include the Wonderlic Personnel Test (WPT) and the Wechsler Adult Intelligence Scale Revised (WAIS-R), which are both used in leader selection, as these are considered reliable (Cronbach's  $\alpha < .68$ ; Taggar, Hackett, & Saha, 1999; Kaufman, 1983) and valid, through concurrent validity correlations for WPT with training scores ( $r > .47$ ,  $p < .05$ ; Taggar et al., 1999) and the WAIS-R with various achievement scores ( $r > .47$ ,  $p < .01$ ; Spruill & Beck, 1986). Though GMA tests, and other such tests for particular capabilities, may be associated with some aspects of leadership, they fail to provide a complete picture, only accounting for one area related to leadership, the



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effectiveness of which may also be context-dependent. For example, DeRue and colleagues (2011) reported that over the 46 primary studies and 13 meta-analytic studies reviewed, GMA tests only accounted for 2-3% of the variance in transformational leadership, with a correlation of only .16. Thus, GMA tests appear to be insufficient in predicting leadership ability, and are therefore inadequate for use in training or selection decisions.

### *Personality Inventories*

As mentioned in the traits theories of leadership, several personality characteristics have been posited to correlate with effective leadership, such as the Five Factor Model (FFM) traits of neuroticism, openness to experience, conscientiousness, agreeableness, and extroversion (Judge et al., 2002). One such measure of these personality traits, for use in selection or training, is the NEO Personality Inventory (NEO-PI; Costa & McCrae, 1992). The NEO-PI is considered a reliable (Cronbach's  $\alpha > .64$ ) and valid (convergent validity through correlations with basic personality scores;  $r_s > .31$ ,  $p_s < .05$ ) measure for the five factors of personality (Costa & McCrae, 1992). Similar to GMA tests, however, personality tests also fail to provide account for more than one aspect of leadership, as evidenced in a meta-analytic study by Judge and colleagues (2002), which reported correlations between .06 and .22 for each of the five personality traits (negative for neuroticism) and effective leadership. Moreover, only two traits, extraversion and openness, were significant predictors for leadership, accounting for 18% and 19% of the variance in leadership effectiveness, respectively. While the findings for personality inventories are more promising than GMA tests, there remains a large amount of leadership effectiveness unaccounted for by personality traits. It has also been suggested by DeRue and colleagues (2011) that these personality traits may underlie behaviours associated with effective leadership. Thus, as we can learn behaviours but not traits, a measure for behaviours provides a more valuable tool for leadership development.

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### *Behavioural Measures*

Regarding behaviours, measurement often occurs during assessment centres, including options such as role-play exercises, in-basket exercises, presentations, and group discussions (Goldstein, Yusko, Braverman, Smith, & Chung, 1998; Whetzel, Rotenberry, & McDaniel, 2014). As one example, Goldstein and colleagues (1998) implemented seven assessment centre exercises, such as role-play exercises, group discussions, presentations, and teamwork tasks. Such exercises often require a trained assessor to conduct and score the task, as the process of witnessing and assessing a group on particular behaviours is complex and requires extensive training. Measurement conducted on a computer, including the LBA, removes a significant cost of administration, as a trained assessor may be unnecessary, especially as computer scoring is possible. Furthermore, only four of the seven exercises significantly correlated with performance, and significant correlations remained small ( $r$ s between .11 and .14; Goldstein et al., 1998).

One option for individual, computer-based assessment is in-basket exercises, wherein the individual receives tasks expected to be found in their 'in-basket' during the course of a normal day for the role of interest (Whetzel et al., 2014). Typical items added to the 'in-basket' may include emails, schedules, letters, memos, and reports, to which the individual is required to respond as they would during the course of a usual work day. The individual may be required to prioritise their tasks, detect errors, or outline solutions to issues, and therefore, these exhibited behaviours are expected to be a more authentic reflection of behaviours the individual would demonstrate in the actual job. Rating scales, multiple choice questions, or checklists are often used to score each in-basket item (Whetzel et al., 2014). One such example is the in-basket developed by Kesselman, Lopez, and Lopez (1982), which was developed to measure problem solving, planning, and decisiveness in administration or technical first-line supervisors. Samples of work items from managers were used to create 26

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in-basket items, including secretary memos, letters to and from staff, reports, phone calls or messages, and employee issues, each of which varied in importance but overlapped in information in some cases. Along with these items a list of possible actions was created, which formulated the items and response options for the respondent to complete, from the perspective of a recently promoted manager within a chemical company. Scoring was determined by subject matter experts (SMEs), where scores were calculated for each item on three criteria (problem solving, planning, and decisiveness), based on a weighted score for perceived 'appropriateness' and 'priority'. Scores created in such a way, however, are entirely subjective, based on the SME's perspective/s. To determine the scores the SME must assume which course of action is most appropriate, which is based only on how the SME interprets the scenario, course of action, and outcome of action. Thus, where the respondent has a different perspective or interpretation, they will score poorly, though alternative interpretations may be valid.

As with the other behavioural exercises assessed by Goldstein and colleagues (1998), in-baskets appear to have limited predictive validity for job performance, as indicated in a meta-analysis by Whetzel and colleagues (2014), where the mean correlation with job performance was .16. Moreover, in-basket exercises have been criticised for a lack of breadth of tasks, claiming they fail to sufficiently encapsulate the role requirements of a manager (Schroder, 2004; Spangenberg & Theron, 2003). Spangenberg and Theron (2003) found their in-basket, designed to measure Schroder's High Performance Leadership Competencies failed to significantly correlate with any of the six criterion measures of managerial success ( $r_s < .17$ ,  $p_s > .11$ ). Though the exercise was created with sound theoretical underpinnings, the authors argue a measurement tool with greater breadth may be necessary to better capture role tasks and allow assessment of the array of behaviours possibly exhibited by a leader. However, the purpose of the in-basket, as with any measurement tool, is to provide a measure

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which correlates with the factor of interest. Thus, provided the in-basket correlates with the performance criteria, and has sufficient breadth for content validity, the measure should be able to function as a work sample of a variety of key tasks, and not need to encompass the entirety of the role. Simply put, for a measure to relate to managerial performance, measurement of every aspect of their role may not be necessary. Moreover, as in-basket exercises generally take around three hours for administration (Spangenberg & Theron, 2003), simply adding a greater number of tasks is not a practical solution, as a greater time commitment is likely to lower user motivation and cause companies to seek quicker alternatives. Such a limitation was considered in creation of the LBA, in the inclusion of numerous sections which each contain several items, to account for breadth. Further, task descriptions were kept as concise and straightforward as possible, limiting reading time. Thus, the LBA allows for breadth of tasks, which many managers completed most of within the allotted 20 minutes. Therefore, rather than taking further time, the time is actually substantially lower than in-basket exercises.

### *1.1.2 Questionnaires*

Questionnaires are perhaps the most widely used leadership assessment tool, such as the Multifactor Leadership Questionnaire (MLQ; Bass, 1985) and the Leadership Behaviour Description Questionnaire XII (LBDQ XII; Stogdill, 1963). Each of these questionnaires requires respondents to rate how frequently they believe they exhibit a number of behaviours expected to predict leadership ability. Specifically, the MLQ is designed to assess the components of Full-Range Leadership Theory, including transformational and transactional leadership mentioned above, and the less effective management by exception and laissez-faire styles, where the user scores the frequency with which they believe they show aspects of each style (Bass, 1985). Similarly, the LBDQ XII requires users to rate the frequency they

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believe they exhibit behaviours categorized into 12 leadership facets, founded in research exploring several hypothesised behaviours for effective leadership (Stogdill, 1963).

These questionnaires, and most others, are assessing the users own 'belief' of the degree to which they exhibit behaviours or other factors. Individuals may not be able to self-assess with high accuracy, or may knowingly respond inaccurately to present themselves more positively. Often, the response options available in questionnaires offer a clear 'best' option for demonstrating high levels of desired behaviours. Thus, respondents may 'play the system' by choosing options which indicate high levels of desirable qualities. Whether purposeful or not, evidence suggests inaccuracy in self-report questionnaires, through a failure to correlate with outcome criteria in predictive validity studies (Atkins & Wood, 2002; Sala & Dwight, 2002). For example, the MLQ and LBDQ XII both require individuals to rate the frequency with which they exhibit certain behaviours, which is entirely subjective and undoubtedly prone to negative or positive self-views.

Choi and Pak (2005) identified 48 different biases, across three areas of questionnaire development and administration (see Table 3), which may skew results. Firstly, within question design, issues may arise from the wording used, failure to adequately acquire data, use of poor scales, leading or intrusive questions, or inconsistencies (Choi & Pak, 2005). For example, ambiguous wording allows for differences in interpretation, and may result in respondents answering under a different meaning than intended and/or differences across respondents' understood meanings. Regarding faulty scales, failure to include a sufficient number of options may force respondents to select inaccurate options, if unable to choose their true response, e.g. lack of a 'not applicable' or 'I don't know' options. Secondly, during design of questionnaires, bias can arise due to formatting, length, and structure (Choi & Pak, 2005). For example, a horizontally arranged response format may create poor spacing or alignment, where the respondent may accidentally select the wrong response. Finally,

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administration of the questionnaire allows several opportunities for bias, such as the interviewer lacking objectivity, conscious or subconscious reactions from the respondent, respondent learning, inaccuracies in recall, and cultural differences (Choi & Pak, 2005). For example, the interviewer may slightly alter wording based on their preconceived ideas of the respondent or subject matter, or interpret responses in a biased manner. Regarding respondent reactions, one commonly reported bias is social desirability, or ‘faking good’, wherein individuals attempt to present themselves in the most positive way, inflating ratings (Choi & Pak, 2005). Thus, self-report questionnaires allow several opportunities for bias, and may be ineffective for providing accurate information regarding leadership effectiveness.

**Table 3.**

### *Sources of Bias in Questionnaires*

Source	Bias
<b><i>Question Design</i></b>	
Problems with wording	Ambiguous question
	Complex question
	Double-barrelled question (two questions in one)
	Short question
	Technical jargon
	Uncommon word
	Vague word
Missing or inadequate data for intended purpose	Belief vs behaviour (hypothetical question, personalized question)
	Starting time
	Data degradation
	Insensitive measure
Faulty scale	Forced choice (insufficient category)
	Missing interval
	Overlapping interval
	Scale format
Leading questions	Framing

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	Leading question
	Mind-set
Intrusiveness	Reporting (self-report response)
	Sensitive question
Inconsistency	Case definition
	Change of scale
	Change of wording
	Diagnostic vogue
<b><i>Questionnaire Design</i></b>	
Formatting problem	Horizontal response format
	Juxtaposed scale (questionnaire format)
	Left alignment and right alignment
Questionnaire too long	No-saying (nay-saying) and yes-saying (yea-saying)
	Open question (open-ended question)
	Response fatigue
Flawed questionnaire structure	Skipping question
<b><i>Administration of Questionnaire</i></b>	
Interviewer not objective	Interviewer
	Nonblinding
Respondent's subconscious reaction	End aversion (central tendency)
	Positive satisfaction (positive skew)
Respondent's conscious reaction	Faking bad (hello goodbye effect)
	Faking good (social desirability, obsequiousness)
	Unacceptable disease
	Unacceptable exposure
	Unacceptability
	Underlying cause (rumination)
Respondent's learning	Learning
	Hypothesis guessing
Respondent's inaccurate recall	Primacy and recency
	Proxy respondent (surrogate data)
	Recall
	Telescope
Cultural differences	Cultural

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*Note.* Table from Choi and Pak (2005).

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In an attempt to overcome the possible biases associated with self-report, many leadership questionnaires offer alternate versions using ratings from supervisors, direct reports, or peers, including the MLQ and LBDQ XII. Although the types of biases associated with self-report are reduced, the opportunity for bias is shifted to the rater, introducing potential biases, such as prototype, halo, and leniency biases (Bass & Avolio, 1989; Ng, Koh, Ang, Kennedy, & Chan, 2011). Prototype bias refers to preconceived ideas influencing ratings, such as the rater's existing idea of what a leader *should* be influencing their ratings for superiors (Bass & Avolio, 1989). Halo effects are similar, though it is the rater's idea of the specific individual which causes the rater to score all aspects similarly, as their overall impression generalises across factors. Leniency is also similar, as it refers to the tendency for a rater to generally inflate all scores (Ng et al., 2011).

Several researchers report a significant difference between self-report leadership ratings and superior, peer, or subordinate ratings (Atkins & Wood, 2002; Atwater, Wang, Smither, & Fleenor, 2009; Sala & Dwight, 2002). A discrepancy in the predictive validity of different raters in predicting performance has also been reported (Atkins & Wood, 2002; Sala & Dwight, 2002). Specifically, Atkins and Wood (2002) assessed predictive validity of self, supervisor, peer, and subordinate ratings of team leader's behaviours through correlations with trained assessor ratings during an assessment centre (AC). A significant difference was shown between self and other's ratings of behaviours ( $F(4, 397)=10.7, p<.001$ ). Furthermore, correlations with the AC scores varied widely across raters, with only positive associations found for supervisor ratings ( $r=.29, p<.05$ ) and subordinate ratings ( $r=.26, p<.05$ ), and strangely, a negative association found for self-ratings ( $r=-.24, p<.05$ ; Atkins & Wood, 2002). Similarly, Sala and Dwight (2002) assessed the predictive validity of self, supervisor, peer, and subordinate Competency Behaviour Inventory (CBI) ratings of senior executives against performance data. Again, significant differences were found between the self and



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others' CBI ratings. Moreover, predictive validity differed between self and other's CBI ratings with performance data, such that only manager and subordinate ratings correlated significantly with performance data, though manager ratings correlated with only two of the four areas of leadership ( $r_s > .19$ ,  $p_s > .05$ ), while subordinate ratings correlated with three areas ( $r_s > .18$ ,  $p_s < .05$ ; Sala & Dwight, 2002). These studies indicate discrepancies between raters, while also illustrating limited predictive validity of some rater types, including self-report. Beyond these issues, specific to hiring, the use of ratings from others is not a viable solution, as reports would be required from those in the applicant's current company.

### 1.3.1 *Psychometric Development*

Technological advances have allowed considerable progress in the methods available for selection and development. Traditional assessment methods used either verbal testimony from the individual or a peer, or questionnaires/tests, which are open to bias. Technological adaptations, however, have allowed more authentic ways to measure behaviours, such as the use of gamification (Hamari, Koivisto, & Sarsa, 2014). Gamification refers to incorporating aspects of game design into other contexts, such as the context of job-related assessment methods (Hamari, Koivisto, & Sarsa, 2014; Mora, Riera, González, & Arnedo-Moreno, 2017). Gamification provides a game-type setting which simulates situations in which individuals are required to exhibit behaviours, and thus, provides a more authentic measure of these behaviours. Due to the game-like setting, users are less aware of the testing environment, and thus, the behaviours exhibited may more closely resemble the 'true' behaviour of the individual.

Gamification has been used widely for training and development purposes (Bodnar, 2014; Hamari et al., 2014; Kim, Song, Lockee, & Burton, 2018; Mora et al., 2017), including some use in leadership development (Bodnar, 2014; Kim et al., 2018). One example is the Airline Game, developed by Gruyer and Toubanc (2012; cited in Kim et al., 2018), which

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simulates managing an air craft fleet and pricing for an airline, teaching users economics and industrial organisation. As evidenced by the Airline Game, gamification may involve simulation, though these are separate methods. Simulations refer to assessments which create a scenario within which the user should place themselves, such as the case for in-basket exercises. One example of gamification without simulation, specific to leadership, is the Deloitte Leadership Academy, which incorporated game elements of points, badges, and virtual rewards in exchange for completion of training exercises, which was successful in increasing training rates (Bodnar, 2014).

Gamification has also been utilised in recruitment and selection tools, though fewer options have been developed thus far. One example is the tool 'Reveal', by L'Oreal, which served to attract and recruit graduates, through creating a virtual workplace, providing recruiters with a relevant work sample to guide talent identification (Allal-Chérif & Bidan, 2017). Though a small number recruitment/selection tools incorporate gamification, an extensive literature search yielded a paucity of such tools specifically for leadership roles. Therefore, an opportunity exists within leadership selection and development for gamified measurement tools. It is important to note, however, that the development and use of such tools may be both time intensive and expensive for companies.

Though evidence supports benefits of gamification for organisational purposes (Bodnar, 2014; Kim et al., 2018; Nacke & Deterding, 2017), it has not been without criticism. Firstly, Bogost (2014) posits that the use of game rewards in exchange for real, valuable behaviours/actions is inappropriate and worthless, and, therefore, exploits users. Such behaviour/actions are generally already requested, however, as often gamification elements are simply added to existing training programs. Further, where participation is voluntary, the use of such rewards would not improve participation, which is unlikely, given the purpose of gamification is largely to improve participation, and evidence supports an improvement

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(Bodnar, 2014). Moreover, ‘exploitation’ could only be argued in the unlikely scenario of mandatory participation and the replacement of real rewards with game rewards. Again, as the aim of gamification is to enhance user experience and/or increase motivation, it is highly unlikely companies would present such an overtly immoral strategy. More pertinent, however, is the theme across critiques of gamification suggesting caution regarding underpinning motivations should be advised (Tansley et al., 2016), which is of particular note for training and development contexts.

### *1.3.2 Summary*

Perhaps the most pertinent issue across the various measurement tools currently available is the issue of subjectivity, which is inherently associated with opportunity for bias. A second important issue the limited predictive validity of several popular measurement types for actual performance criteria. These issues are likely linked, however, as opportunity for bias may be skewing data collected with these measures, decreasing the association with performance. It is vital to develop measurement tools founded in theory and designed to fully encapsulate all relevant aspects of the factor of interest, and to contain objective measures associated with the outcome of interest, as this will decrease opportunity for bias, allowing greater accuracy in information for selection decisions. Though the above does not review all measurement tools presently available, as this was beyond the scope of the present paper,

### *1.4 Construction of the Leadership Behaviour Assessment*

Development of the LBA was initiated by Associate Professor Chris Burt, with the notion to construct an assessment of leadership behaviour, and in 2019 he began consolidating ideas for a measure. The LBA research project expanded to include two Masters’ students, Jessica Lord (the author) and Michael Heslop, in December 2019. Over the subsequent four months the operational aspects of the LBA were developed by Jessica, along with Chris and Michael. The LBA has undergone several iterations to refine usability,

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

general comprehension, and, importantly, to ensure the content of the LBA reflects key behaviours associated with effective leadership, in accordance with leadership theory and literature, as outlined above. Following creation of a full first version of the assessment, beta testing was conducted on a small sample of subject matter experts, and minor revisions were made, including determination that 20 minutes should be sufficient time for completion of the assessment. The inclusion of a time limit was to provide some degree of time pressure, which was considered more realistic, as managers often have several tasks and time frames to juggle, resulting in pressure to perform tasks quickly. Further consideration was made for assessment selection by companies, where limited time is considered a positive factor. Additionally, a time limit allowed for efficient data collection and to limit the time request of participants, encouraging volunteering and completion.

The basis for the web-based assessment is in line with technological advances allowing more authenticity in measuring behaviours. Moreover, the creation of the LBA was not founded on a single leadership theory, an advantage over many other leadership measures. Rather, the LBA was created in accordance with several key leadership theories/styles, wherein behaviours common to multiple theories were included, as identified in Tables 1 and 2. The activities within each section of the assessment, and various responses for each item, were designed to present opportunities for each behaviour to be exhibited. For example, the option to authorise training for development of mentoring skills was designed as an opportunity to promote mentoring. As the individual will be unaware of the ten behaviour types prior to testing, and due to the inability to select all options (in the previous example the user may only authorise six training requests), the ability to ‘play the system’ is greatly reduced. Beyond these, the LBA was also designed to allow for ‘covert’ measures, where the individual is unaware measurement is occurring. These metrics were included to provide opportunity for objective measurement, where the individual can’t ‘play the system’, as they

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

can't know to falsify their behaviour when they're unaware it is being assessed. For example, the total time taken to complete the assessment is expected to indicate quick decision speeds, relating to authenticity of, and confidence in, actions (van de Calseyde, Evans, & Demerouti, In press).

The LBA is designed as an 'online management system', containing several actions a manager may typically be expected to complete in their role. The LBA essentially posits a set of scenarios, wherein the individual must act and make decisions as a high level manager. Thus, 'questions' are work tasks, such as the aforementioned training and development requests, where the user is asked to select which training to authorise. Thus, the user exhibits a behaviour, expected to offer an authentic representation of actions made for actual work tasks. Seven main sections are included in the LBA, each containing up to 17 activities, with between 4 and 14 response options for each, totalling 271 response opportunities within the LBA, as outlined in Table 4. The high number of responses was to allow for several opportunities to present each of the behaviour types included in the LBA. For example, the week schedule contains only one overall activity, to select three of eight options to include in the schedule. The eight possible options were designed to present opportunities for different behaviour types, such as if the respondent selects the 'team member new idea meeting' they are supporting innovation. The high number of opportunities was to provide several options for each behaviour, both across and within sections, to allow for content validity, wherein each aspect of leadership should be encapsulated. Specifically, several types of actions were included to allow for different aspects of each behaviour type to be accounted for, and, therefore, improves the possibility that a high portion of the construct of interest, i.e. the behaviour, is represented.

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

**Table 4.**

*Number and Type of Activity and Response for Each LBA Section*

Section	Activities		Responses		Total
	Number	Type	Number	Type	
Data Monitoring	17	Respond to all	6	Multiple options can be selected for each task	102
Training and Development Requests	12	Respond to all	4	Select one response to each task	48
Week Schedule	1	Overall task is to select 3 of 8 options	8	Select 3 (yes/no type response)	3
Internal Bulletin	1	Overall task for section is to select 6 of 14 options	14	Select 6 (yes/no type response)	6
Incidents	8	Respond to all	5	Select one response to each task	40
Voice Messages	6	Respond to all	4	Select one response to each task	24
Strategy Meetings	12	6 overall tasks, requiring 2 activities each	10	Action 1: 3 – select 1 Action 2: 7 – multiple options can be selected	48
<b>Overall Total</b>					<b>271</b>

### 1.5 The Current Study

In order to assess whether the LBA successfully measures leadership effectiveness, the current study assessed the criterion-related validity (CRV) of the LBA. Specifically, CRV was evaluated through comparing manager LBA measures with team member ratings of manager's leadership effectiveness. As outlined above, each available measure of leadership behaviour is subjective, thus, subordinate ratings were selected as the most appropriate option. Evidence above supports predictive validity of subordinate ratings (Atkins & Wood, 2002; Sala & Dwight, 2002), and sufficient evidence for reliability and validity was required for measure inclusion, as reported in the following section.

## Chapter Two: Methodology

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### Validation Study for the Leadership Behaviour Assessment

#### 2.1 Design

A concurrent criterion-related validity method was used to assess the validity of the Leadership Behaviour Assessment (LBA). Managers completed the LBA at the same time point as one of their direct team members completed a questionnaire rating their leadership behaviours. Manager's LBA scores were compared to their team member ratings of their leadership.

#### 2.2 Participants

The sample consisted of 39 managerial staff from an international bank (Company A; N=21) and an American production company (Company B; N=18) who volunteered to take part in the study. Convenience sampling was used, through approaching managers in each company to request other employees partake in the study. All managers were required to have one team member they have directly supervised for at least one year, to ensure the team member had sufficient understanding of their manager's work behaviour.

##### 2.2.1 Recruitment

For each company, contact was made with an internal manager, to facilitate contact between the researcher and participants. The internal manager approached managerial members of their organisation with study information approved by the researcher to request their participation (see Appendix A). Details of those willing to participate were collated and provided to the researcher. The internal managers were also asked to follow up with the participants prior to study commencement, as a reminder and to inform them the researcher would henceforth contact them directly (see Appendix B). All subsequent contact was directly between the researcher and participants, as outlined in the procedure below.

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

No form of contact occurred at any stage between the researcher and any of the manager's team members. Selection of team members was the choice of each manager, who was instructed to forward on an email to any team member they had overseen for a minimum of one year. Further details are also outlined in the procedure section below. Exclusion criteria consisted only of the minimum time period (one year) the manager had overseen the team member, this was to ensure the team member had sufficient knowledge of their manager's work behaviours. Incentives were provided to encourage the participation of both managers and subordinates, through the use of a draw where five manager-team member pairs from each sample won a set of \$100 grocery (Company A) or Amazon (Company B) vouchers each.

### 2.3 Measures

#### 2.3.1 *Demographic Information*

Demographic details were collected from both managers and team members. Prior to beginning the assessment, the web-based LBA app includes a section including gender, age, highest level of education, first language, company, job title, and occupation. The Qualtrics questionnaire for the team members included four items to capture age, gender (*male, female, or gender diverse*), manager's participant ID, and tenure under manager's direct supervision.

#### 2.3.2 *Leadership Behaviour Assessment (LBA)*

The seven sections of the LBA consist of Data Metrics (DM), Training and Development Requests (TD), Weekly Schedule (WS), Incidents (Inc), Internal Bulletin (IB), Voice Messages (VM), and Strategy Meetings (SM). Each requires the user to process information and make decisions as they deem appropriate, where each task/decision opportunity is designed to allow one or more of the ten behaviour types to be exhibited. Thus, the LBA provides an overt measure of responses, wherein the individual is aware they are



## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

assessed on their choices. These ten leadership behaviour types include collaborates (acquires knowledge), shares knowledge (open), decisive, delegates, develops trust, inclusive, just (promotes justice), promotes mentoring, provides feedback, and supports innovation. A sample activity from the LBA requires the respondent to *Authorise*, *Authorise but delay to next month*, *Request more details*, or *Reject* each of 12 training/development requests, though a maximum of six may be authorised, to maintain staffing levels. Different requests present opportunities to promote different areas, such as a mentoring skills course to promote mentoring. These instances of behaviour presented an option for producing scores from the LBA, wherein the responses could be analysed to identify the underlying leadership behaviour driving particular patterns of actions/responses. Once identified, equations could be made using the response patterns associated with each leadership behaviour. Thus, the LBA was designed to allow creation of ten behaviour scores. Creation of such scores was not done in the present study, and remains a consideration for future LBA development.

Beyond these overt responses, the LBA was also created to include covert measures, where metrics are tracked throughout the assessment, unbeknownst to the individual. The use of covert metrics allows objective measurement of the individual, which greatly reduces the opportunity for ‘playing’ the system, as the individual is not aware they are being assessed on these metrics. The nine metrics consisted of Time on Home Page, Sections Completed, Time Taken, Actions, Response Changes, Time to Decide, Times Opened, Times Opened and No Action, and Percent Listened to Voice Messages (VMs), and are described in Table 5. Seven of these metrics are first measured within individual sections, which are then summated for a total score for each metric. These nine metrics are currently the primary measure of the LBA, expected to relate to ratings of overall leadership effectiveness and individual behaviours associated with leadership effectiveness.

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

**Table 5.**

*Descriptions and Sections Measuring LBA Covert Metrics*

<b>Metric</b>	<b>Description</b>	<b>Section(s)</b>
Time on Home Page	Total time spent on the 'home page' of the LBA (main screen)	Home page – not within sections
Complete Sections	Total number of sections (of seven) where a response is selected for all items	Overall measure – across sections
Time Taken	Total time spent on each section, across all visits	Included in all sections
Response Changes	Total number of times a response is selected and later changed to an alternative response	DM, TD, Inc, IB, and VM
Actions	Total number of actions made on each section; opening items, response selections, response changes, or other clicks	Included in all sections
Time to Decide	Time lapsed before a response is made to an item; from opening a section to first response, between responses, or from opening an item to response	DM and Inc (Each item within both sections)
Times Opened	Number of times each section is opened (initial open and subsequent returns from other page/s)	Included in all sections
Times Opened with No Action	Number of times a section is opened but no actions are made in the section (within that visit)	Included in all sections
Percent Listened VM	Total duration (as a percentage) of each Voice Message listened to – message stops when choice is made	VM (Each item)

*Note.* DM = Data Monitoring, TD = Training and Development Requests, Inc = Incidents, IB = Internal Bulletin, WS = Weekly Schedule VM = Voice Messages, SM = Strategy Meetings.

### *2.3.3 Criterion Questionnaire*

To collect criterion data on leadership effectiveness, several validated measures, were administered to team members of the managerial participants. These measures required team members to provide ratings for their manager. Items from each of the scales outlined below were adapted to ensure wording fit the organisational setting and subordinate-report format

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

(see Appendix C). Additionally, where possible, extraneous, unsuitable, or unclear items from original scales were excluded from the questionnaire. Where item wording was odd or unclear, items were removed to avoid extensive rewording, as this would likely alter the measurement properties of the item. Secondly, removal of extraneous or unclear items allowed reduction of the questionnaire length, as a large number of behaviours were measured and high numbers of items is associated with decreased response quality and rates (Galesic & Bosnjak, 2009; Rolstad, Adler, & Rydén, 2011).

Qualtrics was used to administer all criterion scales. The adapted items were grouped by behaviour in the questionnaire, creating ten questionnaire sections, though the order of these sections, and the order of the items within each section, were randomised, to reduce order effects. To give a rating of the manager's overall leadership effectiveness (OLE), a single item was added, asking respondents "Overall, how effective is your direct manager as a leader?". The questionnaire comprised of 93 items in total (see Appendix D). Of these, 89 items required subordinates to respond using 7-point Likert scales, including 29 negatively worded items. As negatively worded items were reverse-scored, higher scores on each scale indicate higher levels of the behaviour. Shares knowledge items required frequency ratings of behaviours from *very rarely* to *very frequently*. The overall effectiveness item was rated from *highly ineffective* to *highly effective*. All other items required the respondent to rate the extent of their agreement with a brief statement regarding their manager, from *strongly disagree* to *strongly agree*. A further four items captured demographic information.

### *Overall Leadership Scores*

Two measures of overall leadership were included. The first, described above, is the team members rating of the manager's overall leadership effectiveness (OLE). Secondly, a summated score across all criteria scales was produced, referred to as Summed Leadership Effectiveness (SLE). Though expected to correlate highly, these two scores provide two

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

different types of overall leadership effectiveness ratings. The first is essentially a face-value assessment of the leader, which may be more prone to affective states or other temporal factors. Such an assessment remains of interest, however, as individual's assessments of their manager will often be highly subjective and influenced by such factors. The second takes into account a variety of factors, and is likely to produce a more stable and 'calculated' score. The scales which are summed to create the second overall leadership score are described below.

### *Communicates: Collaborates – Acquires Knowledge*

The measure of collaboration was an eight-item adapted version of the Collaborative Work Questionnaire (CWQ; Chiochio, Grenier, O'Neill, Savaria, & Willms, 2012). Evidence is presented for both reliability (Cronbach's  $\alpha=.91$ ), and criterion-related validity through correlations with aspects of collaboration, including team communication, synchronicity, explicit coordination, and implicit coordination ( $r's>.78, p's<.01$ ), as well as outcomes of task and contextual performance ( $r's>.23, p's<.01$ ; Chiochio et al., 2012). An example adapted item for the measure of collaboration is "My manager and the team provide each other with useful information that makes work progress". Sufficient reliability was found for the adapted items for the current sample (Cronbach's  $\alpha=.90$ ).

### *Communicates: Shares Knowledge – Open*

Shares knowledge was measured using a composite scale using an adapted version of the two-item Shares Knowledge subscale of the Leader Empowering Behaviour Questionnaire (LEBQ; Konczak, Stelly, & Trusty, 2000) and an adapted version of the Knowledge Sharing Behaviours scale, developed by Lu, Leung, and Koch (2006). Evidence is provided by Konczak and colleagues for both reliability (Cronbach's  $\alpha=.93$ ) and concurrent criterion-related validity, with job-related outcomes including psychological empowerment ( $r=.42, p<.05$ ), job satisfaction ( $r=.55, p<.05$ ), and organizational commitment ( $r=.35, p<.05$ ), for the Shares Knowledge subscale. A sample item for the measure reads "My

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

manager shares information that I need to ensure high quality results”. The Knowledge Sharing Behaviours scale consists of seven items, including two negatively worded items. Responders provide ratings for how frequently their manager engages in the behaviours outlined in each statement. Lu and colleagues (2006) provide evidence for reliability (Cronbach’s  $\alpha=.80$ ), and criterion-related validity through correlations with self-efficacy ( $r=.37, p<.001$ ), trust ( $r=.31, p<.001$ ), and teamwork ( $r=.31, p<.001$ ). A sample item for the adapted measure reads “In daily work, my manager takes the initiative to share their work-related knowledge with the team”. Sufficient reliability was found for the adapted items for the combined scale (Cronbach’s  $\alpha=.80$ ).

### *Decisive*

An adapted version of the Indecisiveness Scale, developed by Germeijs and De Boeck (2002), was used to measure decisiveness. Though called the ‘Indecisiveness scale’, higher scores on the original scale are indicative of decisive behaviour, in line with other scales included. The adapted scale consists of 15 items, including 7 negatively worded items. Evidence for reliability of the Indecisiveness Scale was provided by Germeijs and De Boeck (2002; Cronbach’s  $\alpha=.91$ ), and evidence for validity is provided by Germeijs and Verschueren (2011), through prediction of decisional problems including choice commitment ( $\beta=-.38, p<.01$ ) and stability ( $\beta=-.14, p<.001$ ). A sample item of the adapted scale used for measurement is “My manager finds it easy to make decisions”. Sufficient reliability was found for the adapted items for the current sample (Cronbach’s  $\alpha=.93$ ).

### *Delegates*

Delegation behaviour was measured using the three-item Delegation of Authority subscale of the Leader Empowering Behaviour Questionnaire (LEBQ; Konczak et al., 2000). Konczak et al., (2000) provide evidence for both reliability (Cronbach’s  $\alpha=.92$ ) and

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

concurrent criterion-related validity, with job-related outcomes including psychological empowerment ( $r=.62, p<.05$ ), job satisfaction ( $r=.63, p<.05$ ), and organizational commitment ( $r=.38, p<.05$ ), for the subscale. A sample item for the measure reads “My manager gives me the authority I need to make decisions that improve work processes and procedures”. Sufficient reliability was found for the adapted items for the current sample (Cronbach’s  $\alpha=.85$ ).

### *Develops Trust*

An adapted version of the Faith in Intentions subscale of the Interpersonal Trust at Work Scale (TWS; Cook & Wall, 1980) was used to assess trust. Evidence is provided by Cook and Wall (1980) for reliability (Cronbach’s  $\alpha>.69$  across studies) and validity (correlations including organisational commitment ( $r>.30, p<.001$ ) and job satisfaction ( $r>.32, p<.001$ )) of the Faith in Intentions subscale. The adapted scale consists of five items, of which a sample item includes “My manager is sincere in their attempts to meet the workers’ point of view”. Sufficient reliability was found for the adapted items for the sample (Cronbach’s  $\alpha=.90$ ).

### *Inclusive*

Inclusive behaviour was measured using an adapted version of the scale used by Nemhard and Edmonson (2006) to measure leadership inclusiveness. Evidence is provided by Nemhard and Edmonson (2006) for both reliability (Cronbach’s  $\alpha=.75$ ), and criterion-related validity, through correlations with outcomes including psychological safety ( $r=.29, p<.01$ ) and quality improvement participation ( $r=.21, p<.01$ ), for the inclusiveness scale. The scale consists of three items, including one reverse-scored item. A sample adapted item is “My manager encourages team members to take initiative”. Sufficient reliability was found for the adapted items for the current sample (Cronbach’s  $\alpha=.73$ ).

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

### *Just (Promotes Justice)*

An adapted version of the six-item Formal Procedures subscale of the Justice Scale used by Niehoff and Moorman (1993) will be included to measure the manager's promotion of justice, or 'just' behaviour. Evidence is provided by Niehoff and Moorman (1993) for both reliability (Cronbach's  $\alpha=.85$ ), and criterion-related validity, through correlations with organisational citizenship behaviours, such as conscientiousness ( $r=.25$ ,  $p<.01$ ) and civic virtue ( $r=.31$ ,  $p<.01$ ), for the Formal Procedures subscale. A sample item for the adapted scale is "Job decisions are made by my manager in an unbiased manner". Sufficient reliability was found for the adapted scale items within the current sample (Cronbach's  $\alpha=.93$ ).

### *Promotes Mentoring*

Measurement of the manager's promotion of mentoring used an adapted version of the Perceived Management Support for Mentoring subscale of the Perceived Support for Mentoring scale (Eby, Lockwood, & Butts, 2006). The subscale consists of six items, three of which are negatively worded. Eby and colleagues (2006) provided evidence for both reliability (Cronbach's  $\alpha=.86$ ) and concurrent criterion-related validity, through correlations with career support ( $r=.20$ ,  $p<.05$ ) and psychosocial support, ( $r=.22$ ,  $p<.05$ ), of the Perceived Management Support for Mentoring subscale. A sample adapted scale item reads "My manager serves as a role model for mentors". Sufficient reliability was found for the adapted items for the present sample (Cronbach's  $\alpha=.87$ ).

### *Provides Feedback*

Adapted versions of the Feedback Quality, Feedback Delivery, Source Availability, and Promotes Feedback Seeking subscales of the Feedback Environment Scale (FES; Steelman, Levy, & Snell, 2004) were used to measure managers' provision of feedback. The

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

scale includes five items for each of Feedback Quality, Feedback Delivery, and Source Availability, and four items for Promotes Feedback Seeking. Thus, a total of 19 items were included, of which 8 were negatively worded. Reliability is supported for each subscale (Cronbach's  $\alpha$ 's > .74) and evidence for criterion-related validity is shown through correlations between each subscale and feedback satisfaction, feedback motivation, feedback seeking, and leader-member exchange ( $r$ 's > .17, all  $ps$  < .01; Steelman et al., 2004). Sufficient reliability was found for the adapted items for the current sample (Cronbach's  $\alpha$  = .94).

### *Supports Innovation*

An adapted version of the Support for Innovation subscale of the Climate for Innovation Measure developed by Scott and Bruce (1994) was used to measure managers' innovation support. Sufficient reliability is shown for the subscale (Cronbach's  $\alpha$  = .92), and criterion-related reliability is supported by a positive correlation with innovative behaviour ( $r$  = .15,  $p$  < .05; Scott & Bruce, 1994). The adapted subscale consists of 15 items, of which 8 are negatively worded. A sample item reads "Creativity is encouraged by my manager". Sufficient reliability was shown for the adapted items with the sample (Cronbach's  $\alpha$  = .83).

## 2.4 Procedure

Following recruitment, managers were assigned a randomly generated participant ID, to allow for anonymity. To initiate data collection, managers were first sent an email with instructions, their participant ID, and a unique link to the LBA (Appendix E). A second email immediately followed, which managers were instructed to forward to a team member of their choice, containing brief study details, instructions, a link to the Qualtrics questionnaire, and their manager's ID to include in the questionnaire (Appendix F). Both managers and team members were requested to complete their respective aspect within three weeks.



## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

### *2.4.1 Manager Procedure*

Managers were instructed to follow their unique link within the email, to complete the LBA, for which they should allow up to 30 minutes in total. The web-based LBA app includes a series of pages prior to beginning the assessment, including confirmation of their participant ID, instructions, and digital consent (see Appendix G). Following pre-assessment pages, the participant may begin the LBA, which initiates a 20minute timer, presented at the top right of the page throughout the assessment. The assessment automatically closed, and presented an end of assessment message, after 20 minutes had elapsed. Participants were, however, permitted to exit the assessment at any time, using the 'Finish Assessment' button presented on the main page. During the assessment, the participant may navigate the seven sections of the LBA in any order they wish, and select responses for each task/decision presented. Raw data for each participant from responses on the LBA is collated in an administration web page created for the LBA.

### *2.4.2 Team Member Procedure*

Team members were instructed to follow the link to the questionnaire, provided in the email forwarded from managers, for which they should allow 20 minutes in total. The link directed them to a brief overview and instructions page on Qualtrics, followed by items for manager ID, tenure with manager, and demographic details. Each subsequent section contained items for one of the ten criterion measures. Participants were asked to respond to each item, using the Likert scale provided, to rate their manager's behaviours (on frequency, effectiveness, or agreement with the item).

### Chapter Three: Results

#### 3.1 Descriptive Statistics and Data Adequacy

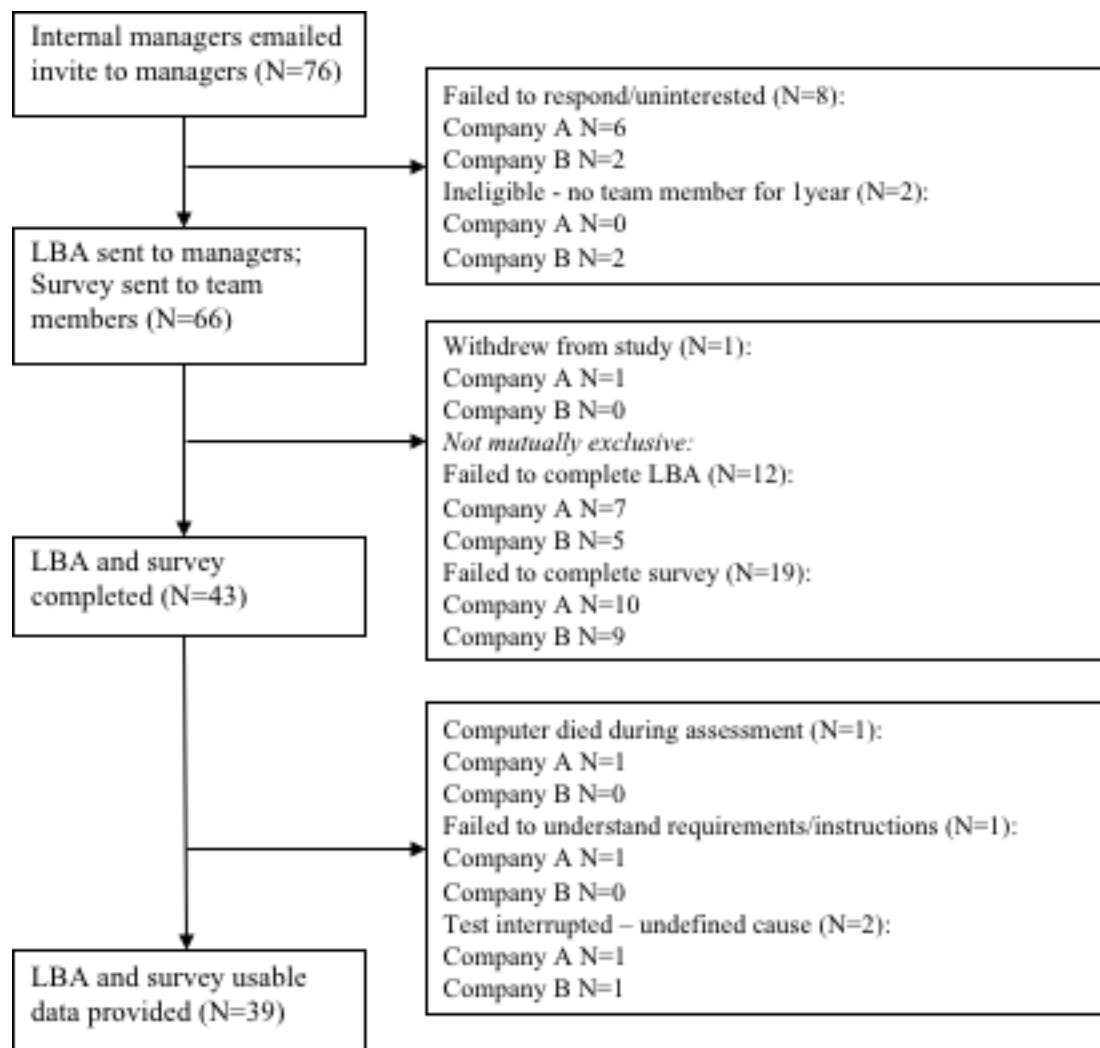
For Company A, the initial email was sent to 41 managers, and yielded interest from 35. Of these, 24 manager-team member pairs completed their respective requirements (the LBA and survey), though only 21 pairs provided usable data. For Company B, the initial email yielded interest from 33 managers, details of which were collated and provided to the researcher. Two managers were removed as they did not meet the requirement for managing staff for one year. Of the 31 invited to participate, 19 manager-team member pairs completed both their respective requirements, though only 18 pairs provided usable data. Thus, as shown in the participant flow diagram in Figure 1, the final sample for analysis consisted of 39 manager-team member pairs. Demographic details of the final sample are shown in Table 6. The managerial participants were predominantly male (69.23%), with a mean age of 40.72years, and an average of 13.4years managerial experience. Team members were predominantly female (51.13%), with a mean age of 37.41years. The mean duration managers had overseen the selected team member was 3.54years.

**Table 6.**

*Sample Demographic Characteristics*

Characteristic	Managers (N=39)		Team Members (N=39)	
	Mean	SD	Mean	SD
Age (years)	40.72	10.56	37.41	9.59
Managerial Experience (years)	13.40	10.44	-	-
Time with Manager (years)	-	-	3.54	4.24
Gender	<i>N</i>	Sample %	<i>N</i>	Sample %
<i>Male</i>	27	69.23	19	48.72
<i>Female</i>	11	28.21	20	51.13
<i>Unspecified</i>	1	2.56	0	0.00

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)



**Figure 1.** Participant Flow Diagram.

Means, standard deviations, and coefficient alphas were calculated for each criterion scale, overall leadership effectiveness (OLE), summed leadership effectiveness (SLE), and LBA metrics for the sample ( $N = 39$ ), as shown in Table 7. For criterion measures, mean values ranged from 6.45 to 7.37, and standard deviations ranged from 0.68 to 1.31. These values indicate that team members generally felt their supervisors displayed high levels of each behaviour and there was low variability in the ratings. Reliability coefficients indicate all scales show acceptable reliability (Cronbach's  $\alpha$ 's  $> .73$ ).

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

**Table 7.**

*Descriptive Statistics, Reliability, and Range Restriction for all Measures*

Measure	Mean	SD	$\alpha$	Skewness Z-value	Kurtosis Z-value
<b><i>Criterion Scales</i></b>					
Faith in Intentions	7.37	0.83	.90	<b>-4.99</b>	<b>5.31</b>
Indecisiveness (R)	6.93	0.90	.93	<b>-6.57</b>	<b>12.39</b>
Delegation of Authority	7.36	0.68	.85	-1.73	-0.96
Support for Innovation	6.53	0.76	.83	-1.50	-0.15
Knowledge Sharing	7.10	0.77	.80	<b>-4.30</b>	<b>4.83</b>
Collaboration at Work	7.07	0.93	.90	<b>-4.23</b>	<b>3.66</b>
Support for Mentoring	6.45	1.22	.87	-1.94	-0.34
Feedback Environment	7.02	0.97	.94	<b>-5.29</b>	<b>5.95</b>
Justice	6.85	1.15	.93	<b>-3.39</b>	<b>2.21</b>
Inclusiveness	7.12	0.93	.73	<b>-5.03</b>	<b>6.36</b>
<b><i>Overall Leadership Scores</i></b>					
SLE	69.47	7.80	.95	<b>-4.15</b>	<b>4.11</b>
OLE	7.23	1.31	-	<b>-8.49</b>	<b>17.96</b>
<b><i>LBA Metrics</i></b>					
Time on Home Page	0.35	0.26	-	1.73	-1.12
Completed Sections	6.46	0.85	-	<b>-4.27</b>	<b>2.63</b>
Time Taken	18.54	2.04	-	<b>-3.20</b>	0.34
Response Changes	5.31	4.87	-	<b>3.00</b>	0.90
Actions	96.44	21.00	-	0.36	-0.38
Time to Decide	5.45	1.56	-	<b>3.47</b>	<b>2.70</b>
Times Opened	8.26	2.45	-	<b>4.34</b>	<b>4.72</b>
Times Opened and No Action	1.03	1.86	-	<b>5.81</b>	<b>5.89</b>
Percent Listened VM	73.93	27.98	-	<b>-3.03</b>	0.19

*Note.* N=39. SLE = Summed Leadership Effectiveness. OLE = Overall Leadership Effectiveness.

**Bold** indicates non-normal distribution.

### 3.1.1 Range Restriction

Skewness and kurtosis were used to identify range restriction for each measure, in accordance with Kim and colleagues (2013), where for a sample fewer than 50, skewness and kurtosis z-scores between -1.96 and 1.96 indicate normally distributed scores. Skewness

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indicates where scores are higher (negative) or lower (positive) than normal and kurtosis indicates whether scores are grouped (negative) or spread (positive). Eight criterion measures showed negative skewness and high kurtosis, as shown in Table 7. High ratings may be due to managers selecting team members they feel would rate them highly. The OLE and Indecisiveness scale both show extreme kurtosis and were investigated for possible outliers. The Indecisiveness scale showed three cases scored an item 1 or 2, while scoring all other items highly. Further examination revealed all cases also gave 2s for items on other scales. Thus, the scores were retained, as there was insufficient evidence they were outliers and may simply reflect the manager's variation in behaviours. Regarding the OLE score, one case scored the manager a 1 overall, while all other ratings across scales were high, with 87 of the 89 items scored higher than 6. As the rating was inconsistent, the score was removed from analysis as a likely outlier. The OLE was reassessed, and though data remained non-normal, values were in line with the other scales, with a skewness z-value = -3.88 and kurtosis z-value = 2.71. Regarding the LBA metrics, though some showed kurtosis and several showed skewness, none were extreme. These were in line with LBA limits on variation, such that most individuals take all the time and complete most sections, but the time limits response changes and extra actions. Given the number of instances indicating non-normal distribution, caution is advised when interpreting results, as relationships are likely to be suppressed.

### 3.1.2 *Factor Analysis*

An exploratory factor analysis was conducted to assess whether the adapted and original scale versions appeared to have the same measurement properties (see Appendix H). A single factor was extracted, with acceptable loadings for all items (>.40), for the Faith in Intentions, Delegation of Authority, Collaboration, Support for Mentoring, Promotes Justice, and Inclusiveness scales, in accordance with original scales (Chiocchio et al., 2012; Cook & Wall, 1980; Eby et al., 2006; Konczak et al., 2000; Nembhard & Edmonson, 2006; Niehoff &

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Moorman, 1993). The remaining scales were designed to measure multiple aspects of their respective factors, and loaded as expected, based on each scale's initial factor analysis (Germeijs & Verschueren, 2011; Konczak et al., 2000; Lu et al., 2006; Scott & Bruce, 1994; Steelman et al., 2004). Items from the LEBQ Knowledge Sharing subscale loaded on the same factor as the Shares Knowledge scale items, supporting creation of a composite score. Thus, all scales showed expected measurement properties and were retained for analysis.

### 3.1.3 LBA Score Independence

Inter-item correlations were conducted for the LBA metrics, as shown in Table 8, to assess for score independence, indicated by significant large correlations ( $r > .70$ ,  $p < .05$ ). One instance where metrics may lack independence was identified between Times Opened and Times Opened with No Action. The high relationship between these metrics is expected, as both measures take into account the number of times an individual opens a section. Both metrics were retained for exploration, however, to assess the relationship either may have with leadership effectiveness, and therefore which may be redundant, if either. The remaining LBA metrics appear to be independent ( $r < .52$ ), and, therefore, are distinct measures.

**Table 8.**

*Intercorrelations<sup>a</sup> Between LBA Metrics*

	1	2	3	4	5	6	7	8
<b>1 Time on Home Page</b>	-							
<b>2 Completed Sections</b>	.27							
<b>3 Time Taken</b>	-.00	-.44						
<b>4 Response Changes</b>	.04	-.27	.45					
<b>5 Actions</b>	-.07	.40	-.01	.35				
<b>6 Time to Decide</b>	.01	-.40	.41	-.01	-.14			
<b>7 Times Opened</b>	.43	.51	-.24	-.15	.23	-.33		
<b>8 Times Opened and No Action</b>	.26	.26	-.11	-.05	.26	-.18	<b>.89</b>	
<b>9 Percent Listened VM</b>	-.27	-.26	-.03	-.09	-.20	.11	-.45	-.32

*Note.* <sup>a</sup>Pearson's correlations. **Bold** indicates possible lack of independence ( $r > .70$ ,  $p < .05$ ).

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### 3.2 Validation

#### 3.2.1 *Criterion-Related Validity*

Criterion-related validity (CRV) was assessed through correlations between nine covert metrics obtained in each LBA section and the ten criterion measures, as well as the two measures of overall leader behaviour (OLE and SLE). Correlation analysis was conducted for the total for each of the nine metrics, and for the metrics for individual sections, with each criterion variable (see Appendix I for full correlation analysis). Table 9 presents the correlations for the total scores for each metric, calculated by summing the scores for each metric across the relevant sections, with criterion scales and overall scores. Three of the LBA metrics showed promise as measures for leadership. Most notably, Time Taken showed a significant positive correlation with both overall leadership ( $r=.48, p<.01$ ) and scale score ( $r=.43, p<.01$ ), as well as several criterion scales including trust ( $r=.44, p<.01$ ), decisive ( $r=.43, p<.01$ ), collaborates ( $r=.52, p<.01$ ), promotes mentoring ( $r=.47, p<.01$ ), provides feedback ( $r=.39, p<.05$ ), just ( $r=.36, p<.05$ ), and inclusive ( $r=.33, p<.05$ ), and also showed a positive trend association with delegates ( $r=.28, p<.10$ ) and open ( $r=.30, p<.10$ ). Conversely, Percent Listened to Voice Messages shows significant negative correlations with supports innovation ( $r=-.32, p<.05$ ) and promotes mentoring ( $r=-.33, p<.05$ ), as well as negative trend associations with delegates ( $r=-.29, p<.10$ ), collaborates ( $r=-.29, p<.10$ ), and inclusive ( $r=-.29, p<.10$ ). Total Actions also showed trend negative correlations with multiple criterion variables, including overall leadership ( $r=-.30, p<.10$ ), open ( $r=-.32, p<.10$ ), and just ( $r=-.32, p<.10$ ).

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**Table 9.**

*Correlations<sup>a</sup> Between LBA Total Metrics and Outcome Variables*

<b>Metrics</b>	<b>OLE</b>	<b>SLE</b>	<b>Trust</b>	<b>Decisive</b>	<b>Delegates</b>	<b>Supports Innovation</b>	<b>Open</b>	<b>Collaborates</b>	<b>Promotes Mentoring</b>	<b>Provides Feedback</b>	<b>Just</b>	<b>Inclusive</b>
<b>Time on Home Page</b>	-0.13	-0.07	-0.17	-0.15	-0.18	-0.02	-0.18	0.07	-0.00	-0.19	-0.13	-0.09
<b>Complete Sections</b>	-0.10	-0.04	-0.08	-0.10	0.02	0.21	-0.11	-0.08	0.13	-0.09	-0.01	-0.03
<b>Total Time Taken</b>	.48**	.43**	.44**	.43**	0.28†	0.23	0.30†	.52**	.47**	.39*	.36*	.33*
<b>Total Response Changes</b>	0.13	0.09	0.19	0.22	0.03	-0.09	0.04	0.12	0.15	0.17	0.13	0.13
<b>Total Actions</b>	-0.30†	-0.24	-0.07	-0.15	0.06	-0.07	-0.32†	-0.24	0.03	-0.21	-0.32†	-0.14
<b>Total Time to Decide</b>	-0.04	0.02	0.07	0.12	-0.07	-0.12	0.04	0.06	-0.13	-0.03	-0.01	-0.09
<b>Total Times Opened</b>	-0.08	0.09	0.06	0.01	0.05	0.25	0.05	0.01	0.11	-0.01	0.08	0.20
<b>Total Times Opened with No Action</b>	-0.10	0.10	0.11	0.01	0.14	0.2	0.12	-0.04	0.07	-0.01	0.08	0.22
<b>Total Percent Listened VM</b>	-0.18	-0.25	-0.25	-0.24	-0.29†	-.32*	-0.17	-0.29†	-.33*	-0.17	-0.19	-0.29†
	<b>OLE and SLE</b>	.90**										

*Note.* <sup>a</sup>Pearson's correlations. † $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ . OLE = Overall Leadership Effectiveness. SLE = Summed Leadership Effectiveness.



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The three LBA metrics related to multiple criterion variables, Time Taken, Actions, and Percent Listened to VMs, were regressed onto OLE and SLE, separately, to assess the variance in leadership accounted for by these metrics. Results of these analyses are shown in Table 10. The metrics together accounted for 37% of variation in OLE,  $F(3, 34) = 6.52$ ,  $p=.001$ , and 32% of variation in SLE,  $F(3, 33) = 5.21$ ,  $p=.005$ .

**Table 10.**

*Regression Analysis for Key Variables Predicting Leadership Ability*

Variable	OLE			SLE		
	B	SE B	$\beta$	B	SE B	$\beta$
Time Taken	.19	.06	.47**	1.62	.54	.43**
Actions	-.01	.01	-.34*	-.09	.06	-.25
Percent Listened to VM	-.00	.00	-.23	-.02	.01	-.30*
$R^2$		.37			.32	
$F$ for change in $R^2$		6.52**			5.21**	

*Note.* N = 37. † $p<.10$ ; \* $p<.05$ ; \*\* $p<.01$ . OLE = Overall Leadership Effectiveness. SLE = Summed Leadership Effectiveness.

The three metrics were then each regressed onto the criterion outcomes they related to. As shown in Table 11, each metric accounted for between 8% and 27% of variance in behaviours, at a minimum trend significance ( $p<.10$ ).

### 3.2.2 Curvilinearity

Curvilinearity was assessed, as some behaviours may have a curvilinear relationship with performance (Le et al., 2011). Linear and quadratic models of the relationship between each metric and OLE and SLE were compared. The quadratic model indicates possible curvilinearity, and was considered a better fit if the variance accounted for was significantly higher than the linear model (change in  $R^2 > .05$ ). Possible curvilinearity was indicated for Time to Decide with SLE (change in  $R^2 = .07$ ) and Times Opened with No Action with OLE (change in  $R^2 = .13$ ). Such relationships will likely suppress associations for these metrics.

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**Table 11.**

*Regression Analyses for Time Taken, Actions, and Percent Listened to VMs Predicting Leadership Behaviours*

Variable	Trust	Decisive	Delegates	Supports Innovation	Open	Collaborates	Promotes Mentoring	Provides Feedback	Just	Inclusive
<b><i>Time Taken</i></b>										
B	.18	.19	.09	-	.11	.24	.28	.19	.20	.15
SE B	.06	.07	.05	-	.06	.07	.09	.07	.09	.07
$\beta$	.44**	.43**	.28†	-	.30†	.52**	.47**	.39*	.36*	.33*
$R^2$	.20	.19	.08	-	.09	.27	.22	.16	.13	.11
$F$ for $\Delta R^2$	9.09**	8.29**	3.10†	-	3.59†	13.31**	10.35**	6.82*	5.43*	4.38*
<b><i>Actions</i></b>										
B	-	-	-	-	-.01	-	-	-	-.02	-
SE B	-	-	-	-	.01	-	-	-	.01	-
$\beta$	-	-	-	-	-.32†	-	-	-	-.32*	-
$R^2$	-	-	-	-	.10	-	-	-	.10	-
$F$ for $\Delta R^2$	-	-	-	-	4.00†	-	-	-	4.10*	-
<b><i>Percent Listened to VMs</i></b>										
B	-	-	-.00	-.00	-	-.00	-.00	-	-	-.00
SE B	-	-	.00	.00	-	.00	.00	-	-	.00
$\beta$	-	-	-.29†	-.32*	-	-.29†	-.33*	-	-	-.29†
$R^2$	-	-	.09	.11	-	.09	.11	-	-	.08
$F$ for $\Delta R^2$	-	-	3.45†	4.21*	-	3.35†	4.56*	-	-	3.35†

Note. † $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ .

## Chapter Four: Discussion

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### A New Method for Measuring Leadership Behaviours

The purpose of the current study was development, and assessment of validity, of a new leadership measurement tool. The new measure, the LBA, has been created in accordance with nine prominent leadership theories, and upon the foundation of ten behaviour types identified across these theories to be associated with effective leadership. The current version of the LBA allows the respondent 20 minutes to navigate an ‘online management system’, within which they are given tasks simulating decisions and actions required by a leader in their daily work. These tasks are presented in the seven sections of the LBA, and each offers opportunities to present behaviours and to allow nine covert measurements to be captured. Measurement properties of these nine metrics were assessed in the present study.

#### 4.1 Results Summary

To assess criterion-related validity, manager’s LBA metrics were correlated with team member ratings on scales for the ten behaviours, a summated score of these scales (SLE), and an overall leadership effectiveness (OLE) rating. Across the nine LBA metrics measured, the time taken to complete the assessment, the percent listened to the voice messages, and the total number of actions made were each associated with multiple of the criterion measures. Specifically, the time taken on the LBA relates to independent ratings of overall leadership (OLE and SLE), develops trust, decisive, collaborates, open (shares knowledge) promotes mentoring, provides feedback, inclusive, and delegates (*rs* between .28 and .52). Percent listened to voice messages was associated with independent ratings of supports innovation, promotes mentoring, delegates, collaborates, and inclusive (*rs* between -.29 and -.33). Lastly, total actions made during the LBA was associated with independent ratings of overall leadership (OLE), open (shares knowledge), and just (promotes justice; *rs* between -.30 and -

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.32). Thus, evidence is provided for criterion-related validity of these LBA metrics as measures of both overall leadership, and individual behaviours associated with effective leadership. Furthermore, the correlations with effective leadership for each of the three covert LBA metrics ( $r$ s between  $-.18$  and  $.48$  for OLE;  $r$ s between  $.24$  and  $.43$  for SLE) were predominantly higher than leadership associations obtained with GMA tests ( $.06$ ), personality tests (between  $.06$  and  $.22$ ; DeRue et al., 2011), several behavioural exercises ( $.11$ -. $14$ ; Goldstein et al., 1998), as well as in-basket exercises ( $.16$ ; Whetzel et al., 2014).

The three covert LBA metrics individually accounted for variance in multiple individual criterion behaviours (between  $8\%$  and  $27\%$ ), and together accounted for a significant amount of variance in both OLE and SLE ( $37\%$  and  $32\%$  respectively). Even with only the three metrics developed thus far, such measurement properties are significant improvements over GMA and personality factors, which only accounted for around  $2$ - $3\%$  and  $18$ - $19\%$  of variance in leadership effectiveness, respectively (DeRue et al., 2011). The LBA, therefore, provides three metrics which are associated with overall leadership and several individual behaviours related to effective leadership. Such metrics can be used to guide selection decisions, through indicating overall leadership effectiveness. Further, these metrics can also provide some indication for training and development, through their associations with particular behaviours.

A further two metrics, Time to Decide and Times Opened with No Action, should not be discounted in their possible contribution to predicting leadership effectiveness, due to the possibly curvilinear relationships. Such relationship between the time taken to make a decision and leadership effectiveness is unsurprising, as making hasty decisions, too quick to process information, would be ineffective for making appropriate decisions, while excessive time for processing may reflect a lack of self-confidence of the leader. Regarding Times Opened with No Action, the number of cases where sections were opened with no action

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completed were severely limited, as indicated by range restriction. Thus, postulation on the nature of the relationship between this metric and leadership effectiveness may be inappropriate. Range restriction may also be an issue for several other metrics, and, in fact, the three metrics associated with overall leadership measures were those with little or no indication of range restriction. It is, therefore, possible that range restriction in the present sample suppressed relationships between LBA metrics and criterion outcomes, and should be considered in future examination.

### 4.2 Implications and Applications

The importance of candidate selection decisions in organisations is very high, especially regarding leaders, with the opportunity to shape the workforce to great benefit or detriment. Existing measures for use in selection decisions leave a lot to be desired, with high propensity for bias, while producing scores with limited ability to predict leaders' actual aptitude. Technological enhancements have provided vast options for improvement to existing tools and measures, presenting the opportunity to reduce or eliminate some measurement issues. Covert measures taken using the LBA related to a number of behaviours associated with effective leadership, as well as overall leadership scores. Such findings suggest the LBA presents a promising new tool for objective measurement, to provide scores which are associated with leadership, which could be used to guide selection decisions.

Even at this early stage of development, findings from the present studies indicate the LBA shows promise, and can produce valuable measures associated with leadership outcomes. With further score development based on the metrics identified, the LBA may be used in leadership selection. Beyond this stage, the LBA will continue to undergo testing and development to identify whether additional metrics currently included may also provide valuable information for leadership effectiveness, where the present study may have been unable to detect this, due to curvilinear relationships or range restriction suppressing possible

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relationships. Further examination will also be conducted to identify whether other metrics may be available or incorporated into the LBA to broaden the measurement scope, which may allow for better encapsulating multiple facets of each of the ten behaviours. Further metrics may allow for greater content validity of the LBA, and may also improve the variance accounted for in leadership effectiveness. Though some room for improvement may be possible, the present measures included in the LBA offer covert, objective measurement associated substantially closer to overall leadership effectiveness than several existing, commonly used measures.

The inclusion of covert measures, where the individual is unaware of the specific measures taken, does raise a possible ethical issue. Due consideration was made under the APA Ethical Principles of Psychologists and Code of Conduct, specifically regarding not intentionally misrepresenting facts. The principal outlines where deception may be justifiable in maximising benefits, with due consideration for possible consequences of such techniques. The respondents of the LBA are knowingly and consensually entering into a testing situation, which will be measuring aspects relating to their leadership effectiveness. Although they are unaware of the precise nature of the measures, such an omission is considered minimally harmful to the individual. Moreover, the measures included do not pertain to any area or information which could be considered sensitive. Should any negative consequence arise from such measurement, however, the researchers will endeavour to make appropriate corrections.

### 4.3 Limitations

Although every endeavour was made to improve sample size, with two companies included and over 70 employees approached, the timing and circumstances resulted in a limited sample of 39. Further, due to missing data, where a small number team members missed a few items, correlation analysis was only able to include between 33 and 39

participants. Thus, the limited sample size and missing data may have resulted in a somewhat underpowered study, unlikely able to detect some relationships between variables, preventing some ‘true’ associations from being identified.

A further possible limitation pertains to the testing condition, or ‘low stakes testing’, where scores on the LBA and criterion questionnaire had no consequence for respondents (Silm, Must, & Täht, 2013). Significant differences are shown in responses under low and high stakes settings (Anglim, Bozic, Little, & Lievens, 2018), though differing reasons for such differences are presented. Some authors claim low stakes testing reduces motivation of respondents, causing overly quick responding, reflective of a lack of authentic responses (Silm et al., 2013). Evidence supporting limited motivational effect of a low stakes assessment is provided by a high frequency of low item response times, where the individual spends insufficient time to achieve comprehension (Silm et al., 2013). Further evidence comes from lower effort on the same test for the low stakes, compared to high stakes, contexts (Wolf & Smith, 1995), as well as substantial variation in motivation levels within low stakes testing (Sessoms & Finney, 2015). Conversely, other authors posit the difference is due to socially desirable responding in high stakes testing (Anglim et al., 2018; Jackson, Wroblewski, & Ashton, 2000; Griffin et al., 2008?). Such a conclusion is supported by a significantly decreased relationship between personality questionnaires and criterion outcomes for high stakes contexts of job application, whether real or imagined, compared to low stakes conditions (Anglim et al., 2018; Jackson et al., 2000). Generally, researchers have investigated differences in high/low stakes from differing perspectives, hence, few authors consider the possibility of both options. Given the evidence for both arguments, it should not be ruled out that ‘true’ scores may lay somewhere between those provided in low and high stakes tests. The underlying cause aside, differing testing consequences appear to produce different responses, which may have affected the results of the present study. Though,

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evidence from Anglim and colleagues (2018) and Jackson and colleagues (2000) supports greater predictive validity of low stakes, compared to high stakes, testing with performance outcomes. Thus, the current study context may be preferred for administration of the criterion questionnaire and evaluating validity of the LBA. Beyond the present study, the LBA is designed for use in high stakes testing, predominantly in selection decisions, where the respondents are job applicants. The use of covert measures substantially reduces the possibility for socially desirable responding, due to the respondent's lack of knowledge of the measurement taking place. Thus, should high stakes cause increased socially desirable responding, the LBA is likely to show little or no artificial improvements in high stakes testing contexts.

As outlined in Chapter 1, subordinate rated questionnaires presented the most appropriate option for criterion measurement, with no current options for objective measurement free from bias. However, such measurement remains open to some degree of bias, and, in fact, the degree of range restriction may have been due to a halo effect. Given the team members were selected by the managers, the managers likely selected team members they expected would rate them highly, possibly contributing to the halo effect. Such methodology was selected due to the need to minimize the time and effort for participants, to encourage volunteering, and to provide anonymity of the team member. Though team members were assured of anonymity, and informed no member of the organisation, including their manager, would see their responses, it could be possible that some team members remained concerned of this, further contributing to high ratings. Lastly, team members may have experienced a boost in feeling for their manager by being chosen, also improving their ratings. Range restriction, possibly due to these factors, may suppress the relationship between variables, which could have prevented identification of some 'true' associations.



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Range restriction was also present among several LBA metrics, with the exception of the metrics where associations with several criterion outcomes were identified. The lack of associations among those with range restriction is unlikely to be coincidental, with the possibility that range restriction is suppressing these relationships, though further study is required to examine this. Range restriction was likely due to the imposed time restriction of 20 minutes. The time limit resulted in most participants spending most or all of their allotted time, and likely prevented many from spending extra time to change decisions, perform extra actions, or re-enter sections. However, the time limit was imposed to simulate the environment of most managers, who are under time pressure at work, to promote responses and actions similar to those conducted in the workplace. Consideration for extending the time limit was made, though it is possible many users would simply spend as much time as they allowed, and increase the number of decision changes and re-entered sections. The time is currently set where most respondents are able to complete most, or all, of the assessment, though very few complete the assessment with much time to spare. Thus, the respondents appear to have sufficient time for processing sections to make informed decisions, while preventing excess time for reconsideration of choices, resulting in selection of their natural or first responses to options. The current limit may also assist with preventing respondents from attempting to deduce the 'right' responses to make, where extending the time could allow greater time for such consideration. Thus, the decision was made to retain the present time limit. Future examination using a variety of samples, such as those with a significantly wider range of experience, may allow for greater variation of data, decreasing the level of range restriction.

Finally, it should be noted that several theories and leadership research outline the necessity to consider the environment, the subordinates or group, and individual factors. The LBA is unable to account for these factors, as measurement tools for selection generally are,

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due to the need for the measure to remain generalizable. Though this is not a limitation, *per se*, it is important to highlight that the LBA should be interpreted according to the specific role, organisation, and setting the recruitment is conducted for.

### 4.4 Conclusion and Future Directions

Beyond the limitations outlined above, the LBA appears to show promise as a new tool for assessing leadership effectiveness. Specifically, the LBA incorporates some covert measures, which are objective and, thus, not susceptible to respondent bias, which show an association with measures of overall leadership and key behaviours associated with effective leadership. Further validation of the LBA is necessary, and intended, to develop these covert metrics. Specifically, assessment of significantly larger and varied samples is required, where response patterns will be examined, in order to identify those associated with each of the ten behaviours. Moreover, examination of the reliability of the LBA is required, though the metrics themselves are objective, and technology minimises measurement error. Although only three of nine metrics related to criterion outcomes, further investigation of all metrics is intended, as the limited sample size and range restriction may have constrained identification of associations.

In its current form, the LBA offers metrics associated with overall leadership effectiveness, which may be used in selection decisions, wherein the more time taken, with fewer actions and less time listened to voice messages, relate to a higher level of rated leadership effectiveness. Thus, the LBA presents a promising new assessment tool for leadership selection, or use in training and development settings.

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## Appendix A.

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### Initial Internal Manager Communication

The following shows the email format used for the first communication by the internal manager to any other managers in their company who may have been applicable to take part in the study. As per the manager's preference, the email was originally created by the internal manager of Company A, though the researcher checked the email to ensure all information was correct. Identifying information is excluded to ensure anonymity of the company and manager.

Hello {insert name},

I am currently helping Jessica Lord, a Canterbury University Masters Student, she is working on a study for a new web-based program to evaluate leadership as part of her masters. The program measures several behaviours associated with effective leadership. The study compares manager's scores on the program to ratings from one of their staff members, by sending the 30min assessment to managers to complete and a 20min survey to one of your staff to complete.

You won't see how you have been assessed and no one from [REDACTED] will be able to see any of the results (from the leadership assessment or the staff survey).

It would be appreciated if you could help Jessica out in this study and all manager/staff member pairs go into a draw to win one of 5 pairs of \$100 grocery vouchers each.

If you are happy to participate can you please use the voting buttons and let me know by end of next week.

Any questions feel free to call.

Thanks,

[REDACTED].



## Appendix B.

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### **Follow-up Internal Manager Communication**

The following email format was used for the second email sent to participating managers in the week prior to study commencement. As with the first email, the internal manager crafted the email and the researcher checked the information was correct. Again, identifying information is excluded to ensure anonymity of the company and manager.

Hello {insert name},

Thank you for your interest in participating in the leadership study for Jessica. The study will begin next week, and she will contact you directly, via email, with a link to complete the Leadership Behaviour Assessment (LBA). The email will also contain a brief message and a link to the criterion survey, for you to forward to a member of your team, who is willing to complete the 20minute survey. Access to both the LBA and survey will be available for two weeks.

Your participation is greatly appreciated by Jessica, as you are providing data vital for both her Masters degree, but also for the development of the new leadership assessment tool.

Thanks

Ps – if you are on annual leave next week it can be sent to your personal email.

██████████

### Appendix C.

#### Scale Items for each Criterion Measure

The following presents all adapted items from scales included in the criterion questionnaire used by team members to rate their manager's behaviours. Original items from each validated measure are also shown, to indicate where wording was changed to suit the context and subordinate-report format, or items removed with brief reasoning for removal.

**Table C1.**

*Original and Adapted Scale Items included in the Criterion Questionnaire*

Original Scale Items	Adapted Scale Items
<b><i>Collaborates (Acquires Knowledge)</i></b>	
My teammates and I provide each other with useful information that makes work progress.	My manager and the team provide each other with useful information that makes work progress.
My teammates and I share knowledge that promotes work progress.	My manager and the team share knowledge that promotes work progress.
My teammates and I understand each other when we talk about the work to be done.	My manager and the team understand each other when we talk about the work to be done.
My teammates and I share resources that help perform tasks.	My manager and the team share resources that help perform tasks.
My teammates and I communicate our ideas to each other about the work to be done.	My manager and the team communicate our ideas to each other about the work to be done.
My teammates and I carry out our tasks at the appropriate moment.	<i>Removed – relates to time management and coordination rather than collaboration</i>
My teammates and I make sure our tasks are completed on time.	<i>Removed – relates to time management and coordination rather than collaboration</i>
My teammates and I make adjustments in order to meet deadlines.	<i>Removed – relates to time management and coordination rather than collaboration</i>
My teammates and I make progress reports.	My manager and the team make progress reports.
My teammates and I exchange information on 'who does what'.	My manager and the team exchange information on 'who does what'.

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

My teammates and I discuss work deadlines with each other.

My manager and the team discuss work deadlines with each other.

My teammates and I can foresee each other's needs without having to express them.

*Removed – requires no communication*

My teammates and I instinctively reorganise our tasks when changes are required.

*Removed – requires no communication*

My teammates and I have an implicit understanding of the assigned tasks.

*Removed – requires no communication*

### ***Shares Knowledge***

In daily work, I take the initiative to share my work-related knowledge to my colleagues.

In daily work, my manager takes the initiative to share their work-related knowledge with the team.

I keep my work experience and never share it out with others easily. (R)

My manager keeps their work experience and never shares it out with others easily. (R)

I share with others useful work experience and know-how.

My manager shares with others useful work experience and know-how.

After learning new knowledge useful to work, I promote it to let more people learn it.

After learning new knowledge useful to work, my manager promotes it to let more people learn it.

I never tell others my work expertise unless it is required in the company. (R)

My manager never tells others their work expertise, unless it is required in the company. (R)

In workplace I take out my knowledge to share with more people.

*Removed – oddly worded, similar items already included*

I actively use IT sources available in the company to share my knowledge.

My manager actively uses IT sources available in the company to share their knowledge.

So long as the other colleagues need it, I always tell whatever I know without any hoarding.

So long as others need it, my manager always tells whatever they know, without any hoarding.

### ***Decisive***

I find it easy to make decisions.

My manager finds it easy to make decisions.

It is hard for me to come to a decision. (R)

It is hard for my manager to come to a decision. (R)

I don't know how to make decisions. (R)

My manager doesn't know how to make decisions. (R)

I know which steps to take when making a decision.

My manager knows which steps to take when making a decision.

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

I would characterize myself as an indecisive person. (R)

I don't hesitate much when I have to make a decision.

While making a decision, I feel certain.

While making a decision, I feel uncertain. (R)

It takes a long time to weigh the pros and cons before making a decision. (R)

I make decisions quickly.

I delay deciding. (R)

I don't postpone making decisions to a later date.

I try to avoid making a decision. (R)

I don't avoid situations where decisions have to be made.

I tend to leave decisions to someone else. (R)

I cut the knot myself in a decision instead of leaving the decision to others.

Once I have taken a decision, I stick to that decision.

I often reconsider my decision. (R)

Once I have made a decision, I stop worrying about it.

After making a decision, I can't get it out of my mind. (R)

After I have decided something, I believe I took the wrong decision. (R)

After making a decision, I don't regret the decision.

I would characterize my manager as an indecisive person. (R)

My manager doesn't hesitate much when they have to make a decision.

*Removed – can't rate manager's feelings*

*Removed – can't rate manager's feelings*

It takes a long time for my manager to weigh the pros and cons before making a decision. (R)

My manager makes decisions quickly.

My manager delays deciding. (R)

My manager doesn't postpone making decisions to a later date.

My manager tries to avoid making a decision. (R)

My manager doesn't avoid situations where decisions have to be made.

My manager tends to leave decisions to someone else. (R)

*Removed – oddly worded, similar items already included*

Once my manager has taken a decision, they stick to that decision.

*Removed – can't rate manager's thoughts*

*Removed – can't rate manager's feelings*

*Removed – can't rate manager's thoughts*

*Removed – can't rate manager's thoughts*

*Removed – can't rate manager's feelings*

### ***Delegates***

My manager gives me the authority I need to make decisions that improve work processes and procedures.

My manager gives me the authority to make

*Complete original version used*

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

changes necessary to improve things.

My manager delegates authority to me that is equal to the level of responsibility that I am assigned.

### ***Develops Trust***

Management at my firm is sincere in its attempts to meet the workers' point of view.

If I got into difficulties at work I know my workmates would try and help me out.

I can trust the people I work with to lend me a hand if I needed it.

I feel quite confident that the firm will always try to treat me fairly.

Most of my workmates can be relied upon to do as they say they will do.

Our management would be quite prepared to gain advantage by deceiving the workers. (R)

My manager is sincere in their attempts to meet the workers' point of view.

If I got into difficulties at work, I know my manager would try and help me out.

I can trust my manager to lend me a hand if I needed it.

I feel quite confident that my manager will always treat me fairly.

My manager can be relied upon to do as they say they will do.

*Removed – use of the word 'deceiving' unlikely to be received well*

### ***Inclusive***

NICU physician leadership encourages nurses to take initiative.

Physicians ask for the input of team members that belong to other professional groups.

Physicians do not value the opinion of others equally. (R)

My manager encourages team members to take initiative.

My manager asks for the input of team members that belong to other areas of the company.

My manager does not value the opinion of others equally. (R)

### ***Just (Promotes Justice)***

Job decisions are made by the general manager in an unbiased manner.

My general manager makes sure that all employee concerns are heard before job decisions are made.

To make job decisions, my general manager collects accurate and complete information.

My general manager clarifies decisions and provides additional information when requested by employees.

Job decisions are made by my manager in an unbiased manner.

My manager makes sure that all employee concerns are heard before job decisions are made.

To make job decisions, my manager collects accurate and complete information.

My manager clarifies decisions and provides additional information when requested by employees.

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

All job decisions are applied consistently across all affected employees.

Employees are allowed to challenge or appeal job decisions made by the general manager.

### ***Promotes Mentoring***

Top management in this organization serves as a role model for mentors.

The organization encourages employees to be mentors.

This organization promotes mentoring opportunities.

There are few rewards available in this organization for mentoring others. (R)

Mentors in this organization receive little recognition for their efforts. (R)

Mentoring relationships are not reinforced by the leaders in this organization. (R)

### ***Provides Feedback***

#### *Feedback Quality*

My supervisor gives me useful feedback about my job performance.

The performance feedback I receive from my supervisor is helpful.

I value the feedback I receive from my supervisor.

The feedback I receive from my supervisor helps me do my job.

The performance information I receive from my supervisor is generally not very meaningful. (R)

#### *Feedback Delivery*

My supervisor is supportive when giving me feedback about my job performance.

When my supervisor gives me performance feedback, he or she is considerate of my feelings.

My supervisor generally provides feedback in a

All job decisions are applied consistently by my manager across all affected employees.

Employees are allowed to challenge or appeal job decisions made by my manager.

My manager serves as a role model for mentors.

My manager encourages employees to be mentors.

My manager promotes mentoring opportunities.

There are few rewards available from my manager for mentoring others. (R)

Mentors receive little recognition from my manager for their efforts. (R)

Mentoring relationships are not reinforced by my manager. (R)

My manager gives me useful feedback about my job performance.

The performance feedback I receive from my manager is helpful.

I value the feedback I receive from my manager.

The feedback I receive from my manager helps me do my job.

The performance information I receive from my manager is generally not very meaningful. (R)

My manager is supportive when giving me feedback about my job performance.

When my manager gives me performance feedback, he or she is considerate of my feelings.

My manager generally provides feedback in a

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

thoughtless manner. (R)

My supervisor does not treat people very well when providing performance feedback. (R)

My supervisor is tactful when giving me performance feedback.

### *Source Availability*

My supervisor is usually available when I want performance information.

My supervisor is too busy to give me feedback. (R)

I have little contact with my supervisor. (R)

I interact with my supervisor on a daily basis.

The only time I receive performance feedback from my supervisor is during my performance review. (R)

### *Promotes Feedback Seeking*

My supervisor is often annoyed when I directly ask for performance feedback. (R)

When I ask for performance feedback, my supervisor generally does not give me the information right away. (R)

I feel comfortable asking my supervisor for feedback about my work performance.

My supervisor encourages me to ask for feedback whenever I am uncertain about my job performance.

### *Supports Innovation*

Creativity is encouraged here.

Our ability to function creatively is respected by the leadership.

Around here, people are allowed to try to solve the same problems in different ways.

The main function of members in this organization is to follow orders which come down through channels. (R)

Around here, a person can get in a lot of trouble

thoughtless manner. (R)

My manager does not treat people very well when providing performance feedback. (R)

My manager is tactful when giving me performance feedback.

My manager is usually available when I want performance information.

My manager is too busy to give me feedback. (R)

I have little contact with my manager. (R)

I interact with my manager on a daily basis.

The only time I receive performance feedback from my manager is during my performance review. (R)

My manager is often annoyed when I directly ask for performance feedback. (R)

When I ask for performance feedback, my manager generally does not give me the information right away. (R)

I feel comfortable asking my manager for feedback about my work performance.

My manager encourages me to ask for feedback whenever I am uncertain about my job performance.

Creativity is encouraged by my manager.

Our ability to function creatively is respected by my manager.

My manager allows people to try to solve problems in different ways.

The main function of members in this team is to follow orders which come down through my manager. (R)

A person can get in a lot of trouble with my

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

by being different. (R)

This organization can be described as flexible and continually adapting to change.

A person can't do things that are too different around here without provoking anger. (R)

The best way to get along in this organization is to think the way the rest of the group does. (R)

People around here are expected to deal with problems in the same way. (R)

This organization is open and responsive to change.

The people in charge around here usually get credit for others' ideas. (R)

In this organization, we tend to stick to tried and true ways. (R)

This place seems to be more concerned with the status quo than with change. (R)

The reward system here encourages innovation.

This organization publicly recognizes those who are innovative.

The reward system here benefits mainly those who don't rock the boat. (R)

manager by being different. (R)

My manager can be described as flexible and continually adapting to change.

A person can't do things that are too different around here without provoking anger from my manager. (R)

The best way to get along with my manager is to think the way the rest of the group does. (R)

People around here are expected by my manager to deal with problems in the same way. (R)

My manager is open and responsive to change.

*Removed – high opportunity for biased responses*

In this team, we tend to stick to tried and true ways. (R)

My manager seems to be more concerned with the status quo than with change. (R)

My manager's reward system encourages innovation.

My manager publicly recognizes those who are innovative.

My manager's reward system benefits mainly those who don't rock the boat. (R)



## Appendix D.

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### Criterion Questionnaire Items

The following presents the full list of items included in the criterion questionnaire used by team members to rate their manager's behaviours. Items requesting manager details were presented first, followed by demographic items. Criterion scale items are grouped by the behaviour measured, though headings were not provided, to reduce understanding of the construct of interest. Scale order and item order within scales were randomised. Reverse worded items are indicated with an (R), though this notation was not presented in the questionnaire.

#### Non-Criterion Items:

##### *Manager Details*

1. What is your manager's ID? (refer to email invite)
2. How long have you worked with the manager who invited you to take this survey?

##### *Demographic Questions*

1. What is your age?
2. What is your gender?

#### Criterion Items:

##### *Collaborates – Acquires Knowledge:*

1. My manager and the team exchange information on 'who does what'.
2. My manager and the team share knowledge that promotes work progress.
3. My manager and the team communicate our ideas to each other about the work to be done.
4. My manager and the team understand each other when we talk about the work to be done.

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

5. My manager and the team provide each other with useful information that makes work progress.
6. My manager and the team make progress reports.
7. My manager and the team discuss work deadlines with each other.
8. My manager and the team share resources that help perform tasks.

### *Shares Knowledge – Open:*

9. After learning new knowledge useful to work, my manager promotes it to let more people learn it.
10. My manager never tells others their work expertise, unless it is required in the company. (R)
11. So long as others need it, my manager always tells whatever they know, without any hoarding.
12. My manager keeps their work experience and never shares it out with others easily. (R)
13. My manager shares with others useful work experience and know-how.
14. My manager actively uses IT sources available in the company to share their knowledge.
15. In daily work, my manager takes the initiative to share their work-related knowledge with the team.

### *Decisive:*

16. It is hard for my manager to come to a decision. (R)
17. My manager makes decisions quickly.
18. My manager doesn't know how to make decisions. (R)
19. My manager doesn't avoid situations where decisions have to be made.

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

- 20. It takes a long time for my manager to weigh the pros and cons before making a decision. (R)
- 21. Once my manager has taken a decision, they stick to that decision.
- 22. My manager tends to leave decisions to someone else. (R)
- 23. My manager tries to avoid making a decision. (R)
- 24. My manager finds it easy to make decisions.
- 25. My manager doesn't postpone making decisions to a later date.
- 26. My manager delays deciding. (R)
- 27. My manager doesn't hesitate when they have to make a decision.
- 28. My manager knows which steps to take when making a decision.
- 29. I would characterise my manager as an indecisive person. (R)

### *Delegates:*

- 30. My manager shares information that I need to ensure high quality results.
- 31. My manager gives me the authority to make changes necessary to improve things.
- 32. My manager delegates authority to me that is equal to the level of responsibility that I am assigned.
- 33. My manager gives me the authority I need to make decisions that improve work processes and procedures.
- 34. My manager provides me with the information I need to meet customers' needs.

### *Develops Trust:*

- 35. I can trust my manager to lend me a hand if I need it.
- 36. My manager can be relied upon to do as they say they will do.
- 37. My manager is sincere in their attempts to meet the workers' point of view.
- 38. I feel quite confident that my manager will always treat me fairly.
- 39. If I got into difficulties at work, I know my manager would try and help me out.

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

### *Inclusive:*

- 40. My manager does not value the opinion of others equally. (R)
- 41. My manager encourages team members to take initiative.
- 42. My manager asks for the input of team members that belong to other areas of the company.

### *Just – Promotes Justice:*

- 43. My manager makes sure that all employee concerns are heard before job decisions are made.
- 44. Job decisions are made by my manager in an unbiased manner.
- 45. All job decisions are applied consistently by my manager across all affected employees.
- 46. To make job decisions, my manager collects accurate and complete information.
- 47. Employees are allowed to challenge or appeal job decisions made by my manager.
- 48. My manager clarifies decisions and provides additional information when requested by employees.

### *Promotes Mentoring:*

- 49. My manager promotes mentoring opportunities.
- 50. My manager encourages employees to be mentors.
- 51. Mentors receive little recognition from my manager in their efforts. (R)
- 52. There are few rewards available from my manager for mentoring others. (R)
- 53. My manager serves as a role model for mentors.
- 54. Mentoring relationships are not reinforced by my manager. (R)

### *Provides Feedback:*

- 55. My manager is supportive when giving me feedback about my job performance.
- 56. I feel comfortable asking my manager for feedback about my work performance.

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

- 57. The performance feedback I receive from my manager is helpful.
- 58. The feedback I receive from my manager helps me do my job.
- 59. The only time I receive performance feedback from my manager is during my performance review. (R)
- 60. My manager does not treat people very well when providing performance feedback. (R)
- 61. My manager gives me useful feedback about my job performance.
- 62. My manager is tactful when giving me performance feedback.
- 63. My manager is usually available when I want performance information.
- 64. My manager is often annoyed when I directly ask for performance feedback. (R)
- 65. I interact with my manager on a daily basis.
- 66. When my manager gives me performance feedback, he or she is considerate of my feelings.
- 67. The performance information I receive from my manager is generally not very meaningful. (R)
- 68. I have little contact with my manager. (R)
- 69. My manager encourages me to ask for feedback whenever I am uncertain about my job performance.
- 70. My manager is too busy to give me feedback. (R)
- 71. When I ask for performance feedback, my manager generally does not give me the information right away. (R)
- 72. I value the feedback I receive from my manager.
- 73. My manager generally provides feedback in a thoughtless manner. (R)

### *Supports Innovation:*

- 74. My manager's reward system encourages innovation.

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

- 75. My manager's reward system benefits mainly those who don't rock the boat. (R)
- 76. My manager is open and responsive to change.
- 77. The best way to get along with my manager is to think the way the rest of the group does. (R)
- 78. A person can get in a lot of trouble with my manager by being different. (R)
- 79. In this team, we tend to stick to tried and true ways. (R)
- 80. People around here are expected by my manager to deal with problems in the same way. (R)
- 81. My manager publicly recognises those who are innovative.
- 82. My manager allows people to try to solve problems in different ways.
- 83. My manager seems to be more concerned with the status quo than with change. (R)
- 84. My manager can be described as flexible and continually adapting to change.
- 85. Creativity is encouraged by my manager.
- 86. The main function of members of this team is to follow orders which come down through my manager. (R)
- 87. A person can't do things that are too different around here without provoking anger from my manager. (R)
- 88. Our ability to function creatively is respected by my manager.

### *Overall Effectiveness*

- 89. Overall, how effective is your manager as a leader?

## Appendix E.

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### Initial Researcher Communication – Manager

The following shows the formats used for the first email sent by the researcher to participants of each company. Emails differed due to different consent needed, for release of information to managers of Company B, as per the company's request, in exchange for their participation. Identifying information is excluded to ensure anonymity of each company and manager.

*Company A:*

Dear Mr./Ms. {insert last name},

Your participation in the leadership study, as mentioned by [REDACTED], involves completing an online assessment. You will also need to select one of your team members, who you have *directly overseen for at least one year*, to complete a brief online survey. You will receive a second email shortly, which is to be forwarded to the team member you select.

Please read the following before beginning your assessment.

### Study Information and Consent

Your participation in this study is voluntary, and you are free to withdraw at any time.

Completion of the assessment implies consent. The results of the project will be included in a thesis and may be published, but you can be assured of the complete confidentiality of data gathered in this investigation. A thesis is a public document and will be available through the University of Canterbury library. All electronic data will be stored in a password protected computer in a locked room, and no person outside of the research team will have access to the data. Data will be destroyed after five years.

No other member of [REDACTED] will be able to see your results. Nor will you be able to see your team member's responses on their survey.

The project is being carried out in partial fulfilment of the requirements for a Master of Science in Applied Psychology at the University of Canterbury by Jessica Lord, under the supervision of Associate Professor Christopher Burt, who can be contacted at

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

[christopher.burt@canterbury.ac.nz](mailto:christopher.burt@canterbury.ac.nz). He will be pleased to discuss any concerns you may have about participation in the project.

The project has been reviewed and approved under the policy of the University of Canterbury Human Ethics Committee, and any complaints should be addressed to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch ([human-ethics@canterbury.ac.nz](mailto:human-ethics@canterbury.ac.nz)).

### Assessment Information

Your participant ID is **{insert ID}**. Please ensure you have this available, to check during the assessment.

The link below will open the assessment in a new browser tab. You should allow a minimum of **30 minutes** to complete the assessment, and you may complete it any time over the next two weeks. You will **not** be able to re-enter the link, so please ensure you are prepared and have sufficient time before starting. Please follow the link below when you are ready to begin the assessment.

### [Begin Assessment](#)

As a token of our appreciation, once you and your team member have completed the assessment and survey, respectively, you will both be entered in the draw to win one of five pairs of \$100 vouchers.

You should receive a second email shortly, to forward to your team member. Please don't hesitate to contact me if you do not receive the second email, or if you have any other questions or issues.

Yours sincerely,  
Jessica Lord

*Company B:*

Dear Mr./Ms. {insert last name},

Your participation in the leadership study, as mentioned by [REDACTED], involves completing an online assessment. You will also need to select one of your team members, who you have *directly overseen for at least one year*, to complete a brief online survey. You will receive a second email shortly, which is to be forwarded to the team member you



## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

select. No member of [REDACTED], including yourself, be able to see your team member's survey responses.

Please read the following before beginning your assessment.

### Study Information and Consent

Your participation in this study is voluntary, and you are free to withdraw at any time.

Completion of the assessment implies consent. The results of the project will be included in a thesis and may be published, but you can be assured of the complete confidentiality of data gathered in this investigation. A thesis is a public document and will be available through the University of Canterbury library. All electronic data will be stored in a password protected computer in a locked room, and no person outside of the research team will have access to the data. Data will be destroyed after five years.

Your company has requested summaries of the assessment results, collated across your training group. You, nor any other member of [REDACTED], will be able to see any individual results, nor will any identifying data be provided to trace results to you. ***Please confirm in response to this email your consent to the inclusion of your results in a group summary.***

The project is being carried out in partial fulfilment of the requirements for a Master of Science in Applied Psychology at the University of Canterbury by Jessica Lord, under the supervision of Associate Professor Christopher Burt, who can be contacted at [christopher.burt@canterbury.ac.nz](mailto:christopher.burt@canterbury.ac.nz). He will be pleased to discuss any concerns you may have about participation in the project.

The project has been reviewed and approved under the policy of the University of Canterbury Human Ethics Committee, and any complaints should be addressed to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch ([human-ethics@canterbury.ac.nz](mailto:human-ethics@canterbury.ac.nz)).

### Assessment Information

Your participant ID is {insert ID}. Please ensure you have this available, to check during the assessment.

The link below will open the assessment in a new browser tab. You should allow a minimum of **30 minutes** to complete the assessment. You will **not** be able to re-enter the link, so

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

please ensure you are prepared and have sufficient time before starting. Please follow the link below when you are ready to begin the assessment.

[Begin Assessment](#)

As a token of our appreciation, once you and your team member have completed the assessment and survey, respectively, you will both be entered in the draw to win one of five pairs of \$100 Amazon vouchers.

You should receive a second email shortly, to forward to your team member. Please don't hesitate to contact me if you do not receive the second email, or if you have any other questions or issues.

Yours sincerely,

Jessica Lord

## Appendix F.

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### Second Researcher Communication – Team Member

The following show the format of the second email from the researcher to participants of both companies. As indicated below, managers were instructed to forward key details from the email to one of their team members, to allow team member anonymity from the researcher. Identifying information is excluded to ensure anonymity of each company and manager.

Dear Mr./Ms. {insert surname},

As part of your participation in the leadership study, please forward the following email on to one of your team members, *who you have overseen for at least one year*. If you have not received the initial email from myself, please contact me in reply to this email.

Begin forwarded email:

Dear team member,

Your manager has volunteered to participate in a leadership assessment study. In order to complete the study, [REDACTED] managers nominate one of their team members to complete a brief survey of their leader's behaviours. Your manager has selected you to complete the survey.

Your time to take this survey would be greatly appreciated, and as a token of gratitude, you and your manager will be entered in the draw to win one of five pairs of \$100 vouchers.

Please read the following information before beginning your survey.

#### **Study Information and Consent**

Your participation in this study is voluntary, and you are free to withdraw at any time.

Completion of the survey items implies consent. The results of the project will be included in a thesis and may be published, but you can be assured of the complete confidentiality of data gathered in this investigation. A thesis is a public document and will be available through the University of Canterbury library. All electronic data will be stored in a password protected computer in a locked room, and no person outside of the research team will have access to the data. Data will be destroyed after five years.

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

No other member of [REDACTED], including your manager, will be able to see your responses to any survey items.

The project is being carried out in partial fulfilment of the requirements of a Master of Science in Applied Psychology at the University of Canterbury by Jessica Lord, under the supervision of Associate Professor Christopher Burt, who can be contacted at [christopher.burt@canterbury.ac.nz](mailto:christopher.burt@canterbury.ac.nz). He will be pleased to discuss any concerns you may have about participation in the project.

The project has been reviewed and approved under the policy of the University of Canterbury Human Ethics Committee, and any complaints should be addressed to The Chair, Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch ([human-ethics@canterbury.ac.nz](mailto:human-ethics@canterbury.ac.nz)).

### Survey Information

Your manager's ID is **{insert ID}**. Please ensure you have this available, as you will be required to enter it in the survey.

The link below will open the survey in a new browser tab. The survey will take a maximum of **20 minutes**, and can be completed any time over the next two weeks. You will **not** be able to re-enter the link, so please ensure you are prepared and have sufficient time before starting the survey. Please follow the link below when you are ready to begin the survey.

**[Begin Survey](#)**

If you have any questions or issues, please contact the manager who forwarded you this email, for them to pass on.

Yours sincerely,  
Jessica Lord

## Appendix G.

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### **Pre-Assessment Information for Leadership Behaviour Assessment**

Each section below indicates information presented in a separate page of the web-based app, prior to presentation of the Leadership Behaviour Assessment (LBA).

#### *Page One – Participant ID:*

##### **PLEASE CONFIRM INVITE DETAILS**

ID: {insert manager participant ID}

#### *Page Two – Overview:*

The Leadership Behaviour Assessment (LBA) is a web-based assessment, which can be used to recruit individuals into leadership/managerial positions, or to provide feedback in a training context.

The LBA is structured as an *online management system* (OMS), which you will have 20 minutes to access. You are to assume that your organisation operates the OMS, which is maintained by your personal assistant (PA) who includes notes for your attention.

#### *Pages Three and Four – Digital Consent:*

##### **DATA PROTECTION:**

The information you provide in completing this assessment will be treated as strictly confidential. It will be stored in a secure database maintained by the University of Canterbury and protected against loss, unauthorised access, modification, and misuse.

In order to proceed with this assessment, please confirm your understanding and acceptance of the above by clicking 'I Accept'.

☐ I Accept

##### **CANDIDATE INFORMATION AND RELEASE FORM:**

Please read through the following information and check the boxes as confirmation of your understanding

- ☐ I understand that the university of Canterbury will receive the database containing my results, and that it will be stored in a collective database for statistical use only. Published statistics will not be traceable back to me.
- ☐ The information I provide will be secured against loss, unauthorized access, modification, disclosure, and misuse.
- ☐ I have reading glasses/contact lenses if required.
- ☐ I am aware of the length of time this evaluation will take.

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

- ☐ I am aware of the nature of the assessment I will be undertaking.
- ☐ I have switched off my mobile phone (if I have one with me).

### *Page Five – Demographic Questions:*

PLEASE ENTER YOUR DETAILS

ID	
{Insert manager participant ID}	
Gender	Age
<input type="text"/>	<input type="text"/>
Highest level of education	First Language
<input type="text"/>	<input type="text"/>
Company	Job Title/Rank
<input type="text"/>	<input type="text"/>
Occupation	In total, how long have you worked in management positions?
<input type="text"/>	Years
	<input type="text"/>
	Months
	<input type="text"/>

### *Page Six – Instructions:*

Assume your organisation operates an online management system (OMS), which is maintained by your PA. Your PA has included notes in red text for you within the OMS.

*Outside of the red PA notes, where the OMS refers to 'myself', 'self', or 'me', this refers to you, the individual undertaking the assessment.*

You have 20 minutes to interact with the OMS, after which the OMS will automatically close. What you choose to do, and what you prioritise, is up to you. If you wish to finish before 20 minutes, click the 'finish assessment' button on the OMS main menu.

Click the button below when you are ready to begin. The button will direct you to the OMS main menu. Clicking a link on the main menu will take you to that section of the OMS.

## Appendix H.

## Factor Analysis Results for Criterion Scales

Table H1 shows the results for Exploratory Factor Analysis, using Varimax Rotation, for each criterion scale items. Separate analyses were conducted for each variable, with the exception of Shares Knowledge, as this was designed to be a composite score from the LEBQ Knowledge Sharing subscale items and the Shares Knowledge scale items.

**Table H1.**

*Factor Analysis Results for each Criterion Scale*

Criterion Scale	Factor Loading		
	1		
<b><i>Faith in Intentions</i></b>			
1. My manager is sincere in their attempts to meet the workers' point of view.	<b>0.66</b>		
2. If I got into difficulties at work, I know my manager would try and help me out.	<b>0.74</b>		
3. I can trust my manager to lend me a hand if I needed it.	<b>0.85</b>		
4. I feel quite confident that my manager will always treat me fairly.	<b>0.89</b>		
5. My manager can be relied upon to do as they say they will do.	<b>0.90</b>		
<b><i>Indecisiveness</i></b>			
	<b>1</b>	<b>2</b>	<b>3</b>
1. My manager finds it easy to make decisions.	<b>0.48</b>	<b>0.53</b>	<b>0.53</b>
2. It is hard for my manager to come to a decision. (R)	<b>0.75</b>	<b>0.44</b>	0.30
3. My manager doesn't know how to make decisions. (R)	<b>0.51</b>	<b>0.66</b>	0.20
4. My manager knows which steps to take when making a decision.	0.33	<b>0.74</b>	<b>0.40</b>
5. I would characterize my manager as an indecisive person. (R)	<b>0.62</b>	0.39	0.37
6. My manager doesn't hesitate much when they have to make a decision.	0.33	0.37	<b>0.60</b>
7. It takes a long time for my manager to weigh the pros and cons before making a decision. (R)	<b>0.73</b>	0.17	0.17
8. My manager makes decisions quickly.	0.21	<b>0.68</b>	0.31
9. My manager delays deciding. (R)	<b>0.86</b>	0.13	0.31
10. My manager doesn't postpone making decisions to a later date.	0.19	0.28	<b>0.79</b>
11. My manager tries to avoid making a decision. (R)	0.11	<b>0.50</b>	0.15
12. My manager doesn't avoid situations where decisions have to be made.	0.24	0.22	<b>0.79</b>
13. My manager tends to leave decisions to someone else. (R)	<b>0.57</b>	0.21	<b>0.42</b>
14. Once my manager has taken a decision, they stick to that decision.	<b>0.55</b>	<b>0.40</b>	0.05

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

<i>Delegation of Authority</i>	<b>1</b>			
1. My manager gives me the authority I need to make decisions that improve work processes and procedures.	<b>.98</b>			
2. My manager gives me the authority to make changes necessary to improve things.	<b>.77</b>			
3. My manager delegates authority to me that is equal to the level of responsibility that I am assigned.	<b>.70</b>			
<i>Support for Innovation</i>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1. Creativity is encouraged by my manager.	0.37	<b>0.74</b>	0.05	0.15
2. Our ability to function creatively is respected by my manager.	0.24	<b>0.60</b>	0.15	<b>-0.41</b>
3. My manager allows people to try to solve problems in different ways.	<b>0.78</b>	0.30	0.07	-0.04
4. The main function of members in this team is to follow orders which come down through my manager. (R)	0.17	0.04	<b>0.62</b>	0.10
5. A person can get in a lot of trouble with my manager by being different. (R)	<b>0.68</b>	0.13	0.16	0.29
6. My manager can be described as flexible and continually adapting to change.	<b>0.70</b>	0.17	0.22	0.01
7. A person can't do things that are too different around here without provoking anger from my manager. (R)	<b>0.61</b>	0.13	0.10	0.15
8. The best way to get along with my manager is to think the way the rest of the group does. (R)	-0.02	<b>0.45</b>	<b>0.62</b>	0.33
9. People around here are expected by my manager to deal with problems in the same way. (R)	0.23	0.09	<b>0.59</b>	-0.06
10. My manager is open and responsive to change.	<b>0.84</b>	0.16	0.28	0.03
11. In this team, we tend to stick to tried and true ways. (R)	0.09	-0.02	0.09	<b>0.55</b>
12. My manager seems to be more concerned with the status quo than with change. (R)	0.31	0.37	0.09	<b>0.41</b>
13. My manager's reward system encourages innovation.	<b>0.57</b>	<b>0.61</b>	0.02	0.05
14. My manager publicly recognizes those who are innovative.	0.07	<b>0.66</b>	0.12	-0.02
15. My manager's reward system benefits mainly those who don't rock the boat. (R)	0.21	<b>0.44</b>	0.32	0.21



## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

<b><i>Shares Knowledge</i></b>	<b>1</b>	<b>2</b>
<i>LEBQ Knowledge Shares</i>		
1. My manager shares information that I need to ensure high quality results.	<b>0.75</b>	0.17
2. My manager provides me with the information I need to meet customers' needs.	<b>0.82</b>	0.22
<i>Shares Knowledge</i>		
1. In daily work, my manager takes the initiative to share their work-related knowledge with the team.	<b>0.51</b>	0.17
2. My manager keeps their work experience and never shares it out with others easily. (R)	0.25	<b>0.86</b>
3. My manager shares with others useful work experience and know-how.	<b>0.94</b>	0.10
4. After learning new knowledge useful to work, my manager promotes it to let more people learn it.	<b>0.77</b>	0.14
5. My manager never tells others their work expertise, unless it is required in the company. (R)	0.03	<b>0.64</b>
6. My manager actively uses IT sources available in the company to share their knowledge.	<b>0.71</b>	-0.03
7. So long as others need it, my manager always tells whatever they know, without any hoarding.	<b>0.54</b>	0.08
<b><i>Collaborates</i></b>	<b>1</b>	
1. My manager and the team provide each other with useful information that makes work progress.	<b>0.92</b>	
2. My manager and the team share knowledge that promotes work progress.	<b>0.86</b>	
3. My manager and the team understand each other when we talk about the work to be done.	<b>0.70</b>	
4. My manager and the team share resources that help perform tasks.	<b>0.86</b>	
5. My manager and the team communicate our ideas to each other about the work to be done.	<b>0.81</b>	
6. My manager and the team make progress reports.	<b>0.68</b>	
7. My manager and the team exchange information on 'who does what'.	<b>0.75</b>	
8. My manager and the team discuss work deadlines with each other.	<b>0.71</b>	
<b><i>Supports Mentoring</i></b>	<b>1</b>	
1. My manager serves as a role model for mentors.	<b>0.73</b>	
2. My manager encourages employees to be mentors.	<b>0.90</b>	
3. My manager promotes mentoring opportunities.	<b>0.85</b>	
4. There are few rewards available from my manager for mentoring others. (R)	<b>0.62</b>	
5. Mentors receive little recognition from my manager for their efforts. (R)	<b>0.83</b>	
6. Mentoring relationships are not reinforced by my manager. (R)	<b>0.78</b>	

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

<i>Feedback Environment Scale</i>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1. My manager gives me useful feedback about my job performance.	<b>0.47</b>	<b>0.67</b>	0.30	0.32
2. The performance feedback I receive from my manager is helpful.	0.25	<b>0.51</b>	0.12	<b>0.70</b>
3. I value the feedback I receive from my manager.	-0.07	0.16	0.20	<b>0.89</b>
4. The feedback I receive from my manager helps me do my job.	0.31	0.10	0.15	<b>0.78</b>
5. The performance information I receive from my manager is generally not very meaningful. (R)	0.29	<b>0.78</b>	0.24	0.34
6. My manager is supportive when giving me feedback about my job performance.	<b>0.81</b>	0.35	0.32	0.23
7. When my manager gives me performance feedback, he or she is considerate of my feelings.	<b>0.54</b>	0.26	<b>0.50</b>	0.11
8. My manager generally provides feedback in a thoughtless manner. (R)	<b>0.53</b>	0.04	0.17	0.03
9. My manager does not treat people very well when providing performance feedback. (R)	0.17	0.27	<b>0.82</b>	0.23
10. My manager is tactful when giving me performance feedback.	<b>0.45</b>	<b>0.59</b>	<b>0.48</b>	-0.03
11. My manager is usually available when I want performance information.	0.35	0.09	<b>0.49</b>	0.03
12. My manager is too busy to give me feedback. (R)	<b>0.61</b>	0.22	<b>0.58</b>	0.27
13. I have little contact with my manager. (R)	<b>0.66</b>	<b>0.55</b>	0.27	0.14
14. I interact with my manager on a daily basis.	<b>0.79</b>	0.38	0.16	0.10
15. The only time I receive performance feedback from my manager is during my performance review. (R)	0.30	0.17	<b>0.51</b>	0.34
16. My manager is often annoyed when I directly ask for performance feedback. (R)	<b>0.45</b>	0.20	0.15	0.14
17. When I ask for performance feedback, my manager generally does not give me the information right away. (R)	<b>0.76</b>	0.18	0.30	0.15
18. I feel comfortable asking my manager for feedback about my work performance.	0.18	<b>0.87</b>	0.24	0.19
19. My manager encourages me to ask for feedback whenever I am uncertain about my job performance.	0.22	0.25	<b>0.44</b>	0.13

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

<b><i>Promotes Justice</i></b>	<b>1</b>
1. Job decisions are made by my manager in an unbiased manner.	<b>0.86</b>
2. My manager makes sure that all employee concerns are heard before job decisions are made.	<b>0.93</b>
3. To make job decisions, my manager collects accurate and complete information.	<b>0.90</b>
4. My manager clarifies decisions and provides additional information when requested by employees.	<b>0.80</b>
5. All job decisions are applied consistently by my manager across all affected employees.	<b>0.88</b>
6. Employees are allowed to challenge or appeal job decisions made by my manager.	<b>0.60</b>
<b><i>Inclusive</i></b>	<b>1</b>
1. My manager encourages team members to take initiative.	<b>0.64</b>
2. My manager asks for the input of team members that belong to other areas of the company.	<b>0.89</b>
3. My manager does not value the opinion of others equally. (R)	<b>0.65</b>
<i>Note.</i> <b>Bold</b> indicates loading >.40	

## Appendix I.

## Correlations Between LBA Metrics and Criterion Scales

Table I1 presents correlations between section and total covert LBA metrics with criterion scales, SLE and OLE.

Table I1.

*Correlations<sup>a</sup> Between LBA Metrics and Outcome Variables*

Metrics	OLE	SLE	Trust	Decisive	Delegates	Supports Innovation	Open	Collaborate	Promotes Mentoring	Provides Feedback	Just	Inclusive
Time on Home Page	-0.13	-0.07	-0.17	-0.15	-0.18	-0.02	-0.18	0.07	-0.00	-0.19	-0.13	-0.09
Complete Sections	-0.10	-0.04	-0.08	-0.10	0.02	0.21	-0.11	-0.08	0.13	-0.09	-0.01	-0.03
<b>Time Taken</b>												
Total	.48**	.43**	.44**	.43**	0.28†	0.23	0.30†	.52**	.47**	.39*	.36*	.33*
DM	-0.10	-0.06	-0.02	0.05	-0.05	-0.12	0.00	0.01	-0.18	-0.08	-0.11	-0.08
TD	.33*	0.25	0.19	0.23	0.22	0.27	0.19	0.25	0.24	0.22	0.27†	0.18
WS	0.21	0.24	0.28†	0.22	0.28†	0.21	0.19	0.24	0.20	0.26	0.04	0.20
Inc	0.14	0.12	0.20	0.17	-0.04	-0.03	0.02	0.12	0.16	0.12	0.13	0.09
IB	0.06	0.04	0.05	0.24	-0.18	-0.15	0.23	0.06	-0.08	0.08	0.02	0.15
VM	0.22	0.21	0.16	-0.02	0.19	0.12	0.22	0.15	0.25	0.13	0.29†	0.09
SM	0.08	0.09	-0.02	-0.00	0.11	0.14	-0.12	0.11	0.25	0.09	0.06	0.07
<b>Response Changes</b>												
Total	0.13	0.09	0.19	0.22	0.03	-0.09	0.04	0.12	0.15	0.17	0.13	0.13
DM	0.09	0.09	0.14	0.09	-0.01	-0.10	0.12	0.13	0.06	0.15	0.14	0.05

## THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

TD	0.28†	0.18	0.17	0.23	0.12	0.17	0.03	0.10	0.23	0.23	0.27†	0.24
Inc	-0.11	-0.12	-0.01	0.04	-0.06	-0.21	-0.21	-0.02	0.02	-0.12	-0.22	-0.06
IB	-0.13	-0.12	-0.08	-0.03	-0.19	-0.13	-0.10	-0.15	-0.09	0.04	-0.20	-0.01
VM	0.06	0.10	0.13	0.14	0.19	0.12	0.08	0.14	0.14	-0.07	0.15	0.04
<b>Actions</b>												
Total	-0.30†	-0.24	-0.07	-0.15	0.06	-0.07	-0.32†	-0.24	0.03	-0.21	-0.32†	-0.14
DM	-.33*	-0.09	-0.01	-0.13	0.14	0.06	-0.07	-0.19	-0.09	-0.17	-0.19	-0.09
TD	0.16	0.00	-0.04	0.05	0.02	-0.01	-0.08	-0.01	0.15	0.07	0.11	0.08
WS	-0.12	-0.03	0.16	-0.01	0.19	0.16	-0.04	-0.06	0.08	0.05	-0.19	-0.03
Inc	-0.14	-0.26	-0.11	-0.05	-0.16	-.33*	-.40*	-0.14	0.03	-0.15	-0.26	-0.09
IB	-0.19	-0.12	-0.07	0.06	-0.06	-0.08	0.03	-0.22	-0.13	-0.02	-0.21	0.02
VM	0.07	0.04	0.07	0.05	0.14	0.11	0.01	0.17	0.16	-0.05	0.20	-0.04
SM	-0.13	-0.26	-0.30†	-0.28†	-0.22	-0.21	-.41*	-0.20	0.03	-0.22	-0.31†	-0.24
<b>Time to Decide</b>												
Total	-0.04	0.02	0.07	0.12	-0.07	-0.12	0.04	0.06	-0.13	-0.03	-0.01	-0.09
DM	-0.10	-0.06	-0.02	0.05	-0.04	-0.11	-0.00	0.01	-0.17	-0.07	-0.11	-0.08
Inc	0.08	0.10	0.12	0.09	-0.03	-0.01	0.06	0.07	0.06	0.06	0.14	-0.01
<b>Times Opened</b>												
Total	-0.08	0.09	0.06	0.01	0.05	0.25	0.05	0.01	0.11	-0.01	0.08	0.20
DM	-0.03	0.10	0.12	0.11	0.10	0.13	0.08	0.01	0.11	-0.04	0.05	0.22
TD	0.08	0.16	0.05	0.04	-0.03	0.23	0.16	0.18	0.21	0.04	0.22	0.17
WS	-0.09	-0.01	-0.01	0.00	0.24	0.11	-0.08	-0.06	0.08	-0.02	-0.11	0.05
Inc	0.06	0.11	0.13	0.03	-0.16	0.22	0.08	0.05	0.03	0.14	0.11	0.19
IB	-0.30†	-0.14	-0.06	-0.03	-0.01	-0.07	-0.02	-0.25	-0.16	-0.25	-0.19	-0.07

# THE LEADERSHIP BEHAVIOUR ASSESSMENT (LBA)

VM	0.08	0.17	0.06	-0.12	0.12	0.26	0.17	0.14	0.20	0.06	0.22	0.14
SM	-0.18	-0.01	-0.09	-0.05	0.07	0.17	-0.11	-0.03	0.06	-0.09	0.04	0.09
<b>Times Opened with No Action</b>												
Total	-0.10	0.10	0.11	0.01	0.14	0.2	0.12	-0.04	0.07	-0.01	0.08	0.22
DM	-0.08	0.02	0.08	0.07	0.02	0.03	0.05	-0.03	0.01	-0.06	0.01	0.15
TD	0.03	0.23	0.15	0.10	0.08	.32*	0.25	0.23	0.19	0.06	0.24	0.21
WS	-0.08	0.08	0.03	-0.05	0.21	0.17	-0.04	-0.02	0.12	0.01	-0.01	0.21
Inc	0.00	0.12	0.14	-0.06	0.09	0.23	0.16	-0.07	-0.03	0.15	0.11	0.18
IB	-0.26	-0.11	-0.08	-0.15	0.08	-0.02	-0.03	-0.25	-0.11	-0.24	-0.13	-0.04
VM	0.12	0.22	0.18	-0.05	0.22	0.27†	0.23	0.13	0.24	0.09	0.24	0.18
SM	-0.12	0.05	0.08	0.08	0.07	0.12	0.07	-0.07	0.05	-0.03	0.05	0.19
<b>Percent Listened VM</b>												
Total	-0.18	-0.25	-0.25	-0.24	-0.29†	-.32*	-0.17	-0.29†	-.33*	-0.17	-0.19	-0.29†
Finance	-0.15	-0.17	-0.17	-0.06	-0.31†	-0.28†	-0.13	-0.17	-0.27†	-0.14	-0.18	-0.23
Health	-0.08	-0.18	-0.10	-0.17	-0.21	-0.28†	-0.13	-0.21	-0.26	-0.09	-0.15	-0.15
H&S Issue	-0.21	-0.25	-0.18	-0.22	-0.18	-0.29†	-0.16	-0.25	-0.31†	-0.15	-0.16	-0.27†
Personal Issue	-0.15	-0.22	-0.23	-0.26	-0.28†	-.33*	-0.18	-0.26	-0.26	-0.18	-0.18	-0.29†
Team Advice	-0.07	-0.13	-0.18	-0.22	-0.15	-0.13	-0.08	-0.19	-0.15	-0.04	-0.05	-0.21
Shipping	-0.23	-0.29†	-.34*	-0.25	-0.31†	-0.30†	-0.14	-.37*	-.38*	-0.21	-0.22	-0.28†
<b>OLE and SLE</b>												
		.90**										

Note. †Pearson's correlations. † $p < .10$ ; \* $p < .05$ ; \*\* $p < .01$ . SLE = Summed Leadership Effectiveness. OLE = Overall Leadership Effectiveness.